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AMERICAN VETERINARY MEDICAL ASSOCIATION

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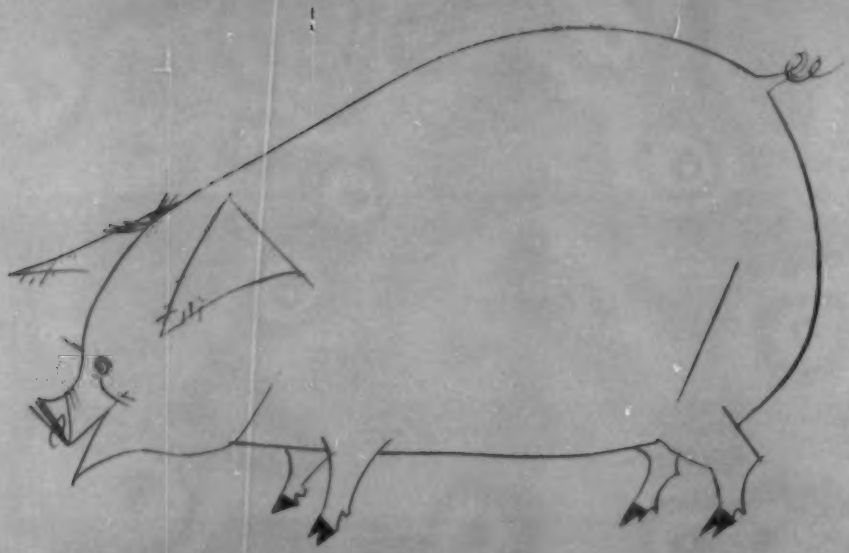

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AVMA ☆ Report

Veterinary Medical Activities

✦ President Floyd Cross attended and took part in the programs of the New England V.M.A. meeting at Poland Springs House, Maine, October 2-5; the Purdue Annual Short Course for Veterinarians, Lafayette, Ind., October 6; and the joint meetings of the Southern V.M.A. and Florida V.M.A. in Jacksonville, Fla., October 16-19.

* * *

✦ President-Elect Wayne O. Kester and Dr. J. A. McCallam, Washington representative, were on the program of the District of Columbia V.M.A. which held an all-day meeting on October 11.

* * *

✦ Assistant Executive Secretary H. E. Kingman, Jr., attended the veterinary conference at the University of Illinois, Urbana, October 13-14.

* * *

✦ The Board of Governors (Drs. J. M. Arburua, *chairman*, Floyd Cross, and Wayne O. Kester) met at Association headquarters on October 20-21.

* * *

✦ About 30 members of the senior class in veterinary medicine at Alabama Polytechnic Institute were guests of the Association on September 19, while in Chicago to observe operations in packing plants and nearby biological and pharmaceutical manufacturing plants. Dr. Lew Llewellyn of the API faculty was in charge of the group; he has conducted groups on this tour for several years.

* * *

✦ About 30 officers of the Army and Air Force Veterinary Corps, who attended the Dairy and Meat Hygiene School at the Quartermaster Depot, visited Association headquarters on September 23. Of the 30 officers in this class, 2 are foreign veterinary officers (from Greece and from Turkey). Members of the AVMA staff spoke to the group on the organization and activities of the Association and on other professional matters.

* * *

✦ Editor W. A. Aitken attended the veterinary division of the annual student-faculty banquet at Iowa State College, Ames, on Thursday, October 6. He spoke on veterinary problems, especially those related to the practice of veterinary medicine.

* * *

✦ Brigadier General J. A. McCallam, of the Association's Washington office, spoke on "Social Security and the Veterinary Profession" at the annual meeting of the Pennsylvania V.M.A. in Harrisburg, Oct. 12-14, 1955.

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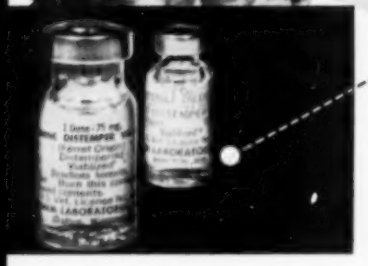

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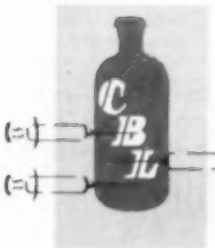

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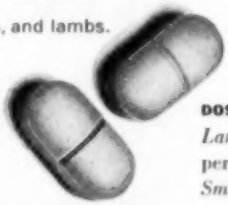

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Large animals: 5 to 10 mg. per lb. per day, preferably in divided doses.
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For infectious enteritis: ½ to 2 tablets for 1 or 2 days are usually sufficient.

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INDICATIONS:

1. **As a growth promotant, in poultry and swine rations.**
2. **As a primary treatment for swine bacterial enteritis in herds showing no systemic reaction.**
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4. **To minimize relapses.**
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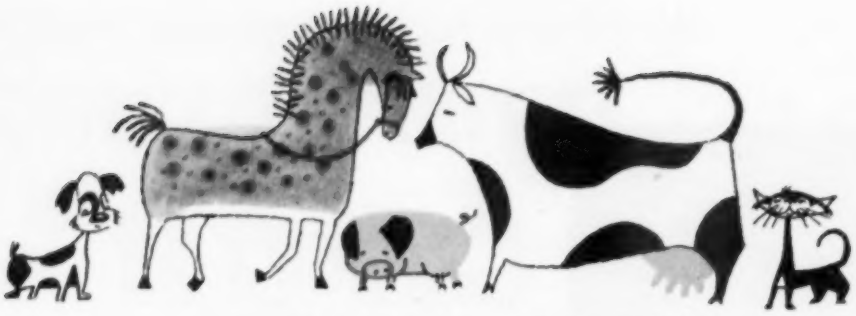

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1. Rachman, M., and Frucht, T. R.: Vet. Med. *49*:341, 1954.
2. Sternfels, M.: Vet. Med. *50*:82, 1955.

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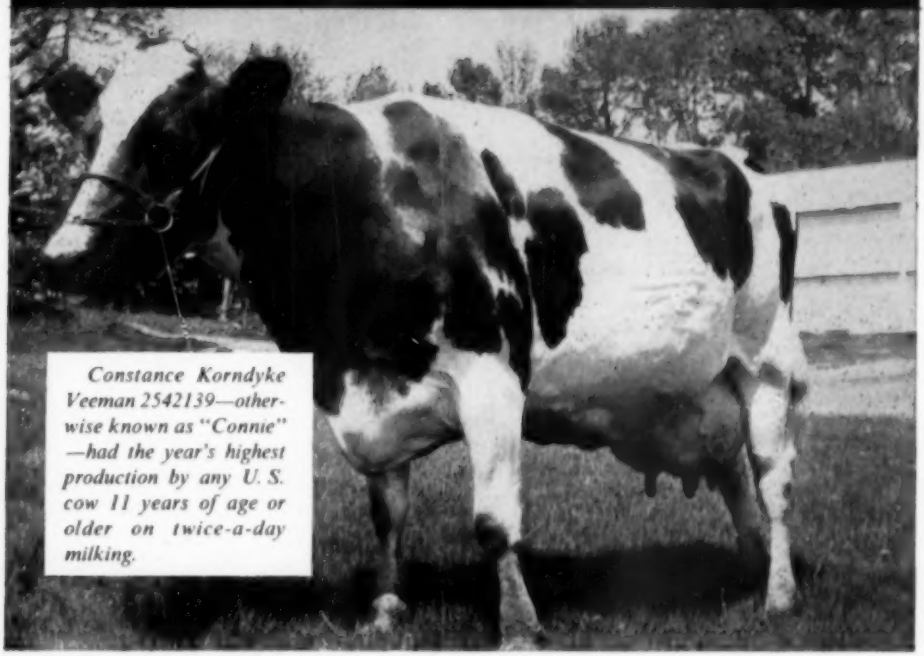

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HOW DOES IT RAISE THE BLOOD CALCIUM LEVEL?

By supplementing the hormone secreted by the parathyroid glands. This calcium-raising action of Parterol is produced by mobilizing calcium stored in the bones and increasing the absorption of calcium from the intestinal tract.

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To prevent relapses in milk fever by supplementing the parathyroid hormone during periods of stress on the calcium-regulating mechanisms due to increased demand for calcium at parturition. After treatment with calcium, Parterol should be given at the rate of 10 mg. per cow.

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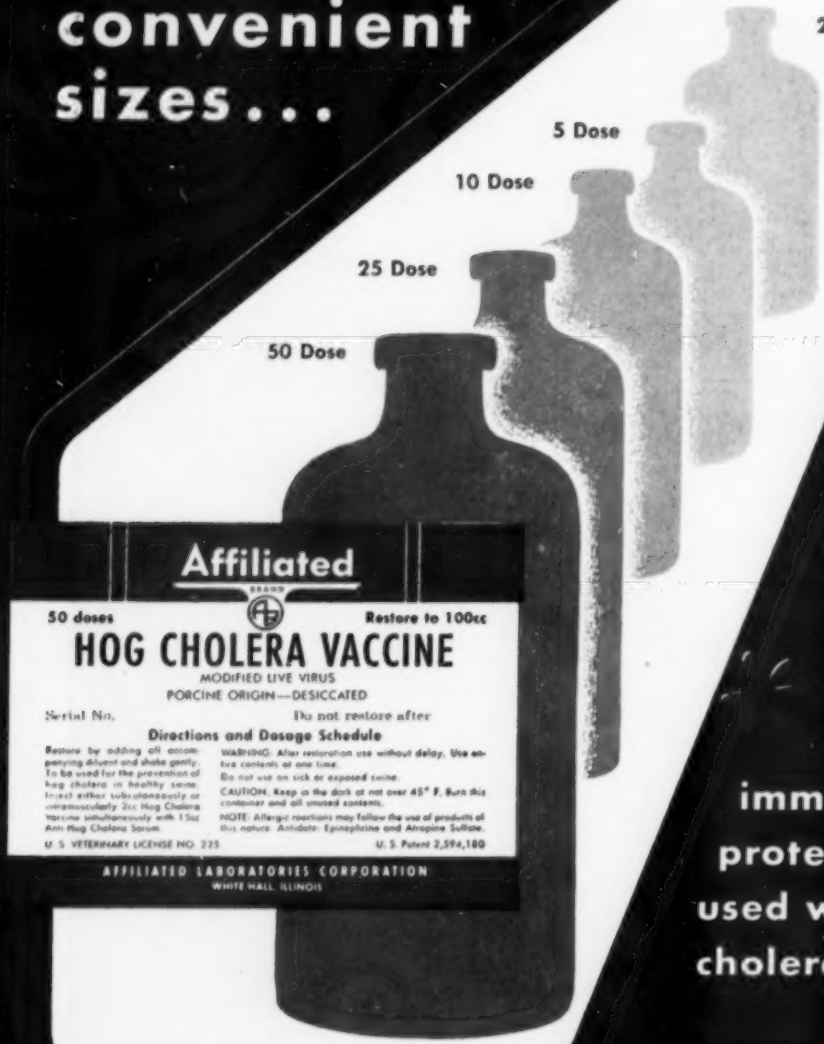
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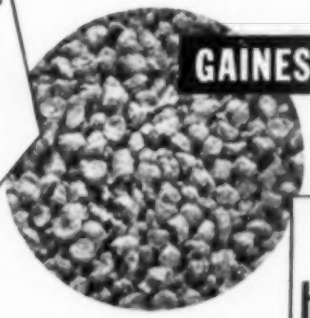

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Classification, Symptomatology, and Recent Treatment of Animal Dermatomycoses (Ringworm)

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Philadelphia, Pennsylvania

DERMATOPHYTES represent relatively the best known group of pathogenic fungi which invade only the skin in its superficial layers. With the exception of some allergic phenomena, they produce no systemic changes as other groups of mycotic infections do.

CLASSIFICATION

The many different terms used in veterinary medicine for the specification of the same fungous infection have created difficulties in classification of many animal dermatophytoses, particularly pertaining to the location and clinical appearance of the cutaneous lesions. Intensive recent research in both human and veterinary mycology has cleared up and explained many problems. Both fields of medicine are interested in fungous infections because of their mutual transmissibility.

While one species of dermatophytes can produce various skin manifestations on different regions of the body surface, a different species can produce the same type of lesions when located only on specific areas. Therefore, the classification of dermatomycoses used by human dermatologists often is based on the part of the body surface involved, e.g., ringworm of the feet or athlete's foot, ringworm of the groin or gym itch, ringworm of the scalp. Similar terms are used in veterinary medicine, e.g., girth itch in horses, ringworm of the comb in fowl. The mycotic lesions occurring on the head, abdomen, and other parts of the body have differed not only in their clinical appearance, but also in their prognosis and treatment results. An attempt to classify the dermatophytoses in animals on an etiological basis often is not satisfactory, particularly with regard to the reliability of the clinical and laboratory testing methods.

The clinical appearance may be helpful in determining the etiological basis of ringworm, particularly in dogs, cats, and cattle, because some species of dermatophytes prefer a specificity of hosts and produce specific lesions restricted to certain cutaneous areas. There may be, however, exceptions in the character of the lesions, their location, and prognosis, depending on a special individual predisposition of the affected animal.

Ultraviolet radiation (Wood's light) may be a valuable aid in the clinical differential diagnosis of some dermatomycoses of animals, but not for all species of fungus causing infection. In dogs, cats, monkeys, and horses, when the causative fungus is *Microsporum canis*, there is a fluorescence of the hair. When, however, the infection has been caused by *Trichophyton mentagrophytes*, *Trichophyton verrucosum*, or *Achorion schoenleini*, there is no fluorescence. Therefore, this method is of limited significance.

The fluorescence seen in a *M. canis* infection is greenish and is found mainly on the hair and on the periphery of the skin lesions. In cats and dogs, we have found fluorescence on the hair in areas which

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Fig. 1—Spores of Microsporum canis in skin scrapings. x 240.

showed no skin lesions. Particularly in adult animals, fluorescence has been caused by the presence of *M. canis*, while the skin of the whole body surface was without visible lesions. Those animals seem to be only carriers but, nevertheless, are the main source responsible for spreading the disease.

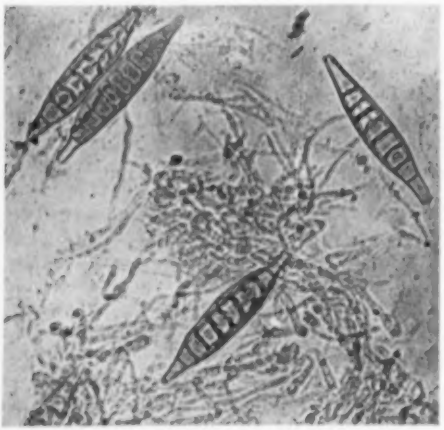


Fig. 2—Microsporum canis on Sabouraud's dextrose agar showing multiseptate, spindle-shaped macroconidia. x 160.

Microscopic tests of scrapings taken from suspected skin lesions or of hair showing fluorescence are, as a rule, reliable yet relatively simple. The fungous elements have been found in or on the shafts and base of the hair, particularly when they were pulled from the periphery of the dermatophytic lesions or when the scrapings were taken from the periphery of the affected areas. In cases of *M. canis* infection, the fluorescence may be helpful in collection of the clinical material. This fluorescing material may show up easily, revealing the presence of the microscopic fungous elements. In Trichophyton and Achorion infections, the fungus spores or mycelium have also been found relatively easily on the shafts or roots of the hair or on the scales in their vicinity.

For staining of the hair or skin scrapings, the lactophenol cotton blue stain has been suitable. It consists of:

Phenol crystals	20 Gm.
Lactic acid	20 ml.
Glycerol	40 ml.
Distilled water	20 ml.

Dissolve by heating gently under a hot water tap. Add 0.05 Gm. cotton blue.[1]

For microscopic examination, we use first the low power (100 x) to see the spores or mycelium on the hair or scales, and then the high power lens (430 x, 450 x, or 480 x) for a more detailed picture (fig. 1). Although the finding of fungous elements indicates infection, we are not able to differentiate the species. The size of the spores and the positive fluorescence may be helpful in diagnosing *M. canis*, but the accurate differentiation of the fungous species can be made only by culturing the material.

For culturing, we use various mediums. The standard medium used for the isolation of ringworm fungi is Sabouraud's dextrose agar at pH 5.5. With heavily contaminated material, such as animal hair and scrapings, better culture results are obtained by the use of cycloheximide medium to which has been added several antibiotics. Incubation should be at room temperature (25 to 30 C.) for at least four weeks. In positive cultures, the fungous colonies are differentiated macroscopically according to their characteristics, shape,

and color, and microscopically with regard to the size and shape of the spores (macroconidia), walls, and septation (fig. 2).

Microsporum and Trichophyton Infections

In animals, the two main groups of ringworm fungi, Microsporum and Trichophyton, have been found and isolated.

Microsporum Infections.—Microsporum infections have mainly been found in dogs, cats, monkeys, chinchillas, and horses. The most common species isolated has been *M. canis* (syn.: *Microsporum felineum, Microsporum lanosum*). *Microsporum gypseum* (syn.: *Microsporum fulvum, Achorion gypseum*) and *Microsporum audoini* (syn.: *Microsporum villosum, Microsporum velveticum*) have been relatively rare and very rare in occurrence, respectfully.

Clinical Symptoms.—Dogs.—The first symptom of infection by *M. canis* in the dog is loss of hair in scattered lesions particularly on the head, legs, tail or on other parts of the body. The well-defined, hairless areas are soon covered with scales or grayish white crusts. The lesions enlarge by loosening or breaking of the hair stumps. When the thick crusts are removed, there is a moist base. There is, as a rule, just a mild itching and no pruritus.

Cats.—*Microsporum canis* lesions in the cat are mainly located on the head, above the eyes, on the lower lip and on the neck; however, other parts of the skin may be involved. First, there is loss of hair and considerable scaliness, the shape of the lesions often being round. The unpigmented skin may show a reddish discoloration. Heavy grayish white crusts soon develop. In kittens, a more diffuse scaliness develops over large parts of the body, hair is lost in larger irregular patches, and sometimes heavy crusts can be palpated through the coat. In mature cats, fluorescence of the hair is often found without any lesions. Thus, mature cats are real carriers of the fungous infection.

Monkeys.—In monkeys, the *M. canis* has been usually found on the tail, face, and extremities. The hair is lost on irregularly shaped areas and, in severe cases, the entire body surface may be involved. The lesions are scaly, covered with hair stumps and, in advanced cases, grayish white crusts develop. In ring-tailed monkeys, a chronic dermatomycosis caused by *M. canis* develops in the form of a chronic hyperkeratosis (fig. 3).

Fig. 3—Chronic dermatomycosis, in a ring-tailed monkey, caused by Microsporum canis.

Chinchillas.—In chinchillas, the ringworm lesions caused by *M. canis* are found

Fig. 4—Spores of Trichophyton verrucosum in skin scrapings. x 240.

Fig. 5—Ringworm lesions in a horse, caused by Trichophyton mentagrophytes.

on the head or scattered over the whole body. There is irregular loss of hair, and heavy grayish crusts are palpable through the fine hair. Pruritus is relatively minor, as a rule. Only a secondary infection, which results in superficial suppuration, may cause itchiness.

Fig. 6—Tinea glabrosa in a dog, caused by Trichophyton mentagrophytes.

Horses.—The *M. canis* infection of horses has been characterized by small, scattered, well-defined, rounded hairless lesions, covered with tiny scales and located mainly in the shoulder region or in other areas where harnesses or girths rub the skin. It is quite contagious, so within a short time many horses, particularly young ones, may be affected. Because of the high degree of pruritus, this type of tinea has been called "girth itch."

Trichophyton Infections.—The species of Trichophyton most often isolated in ringworm infection in animals has been *T. mentagrophytes* (syn.: *T. gypseum, Trichophyton granulosum, Trichophyton equinum, Trichophyton caninum, Trichophyton felineum*), *T. verrucosum* (syn.: *Trichophyton faviforme, Trichophyton album, Trichophyton discoides, T. equinum*), *Trichophyton schoenleini* (syn.: *A. schoenleini*), and *Trichophyton gallinae* (syn: *Achorion gallinae*). These do not show any fluorescence on ultraviolet light.

Trichophyton mentagrophytes is a common dermatophyte in horses. Occasionally, it has been found in dogs, cats, rabbits, chinchillas, monkeys, and some experimental animals, such as mice and guinea pigs.

Clinical Symptoms (*T. Mentagrophytes* Infection).—Horses.—In horses, the trichophytic skin lesions have been located mostly on the head (fig. 5), neck, at the base of the tail, on the extremities and, in advanced cases, they may be found anywhere on the body. The lesions are either rounded or in irregular shapes of various sizes, are hairless, and are covered with heavy grayish crusts with short hair stumps. Initially, the lesions are small, then they gradually enlarge forming round spots which may fuse into irregularly shaped areas. In the beginning stage, there may be papules, vesicles, and pustules, especially on the periphery of the lesions. When these rupture, their contents form crusts. When the crusts are removed, suppuration may be discovered beneath. Healing of the untreated lesions starts at the center, where new hair grows, surrounded by scales or crusts. When these trichophytic lesions are limited to the superficial layers of the skin, there is little or no itching, but in deeper invasions there may be

an essential itching. Some practitioners have observed deeper trichophytic skin lesions in horses caused by *T. mentagrophytes*, in the course of which sudden, itchy papular skin eruptions have developed over the entire body. These newly developed lesions in which no fungous elements were found have been considered as a fungous allergic phenomenon.

Dogs.—In dogs, *T. mentagrophytes* has been isolated from lesions which developed in the smooth skin areas resembling similar lesions found in man, and termed tinea corporis (tinea glabrosa). These lesions in dogs were located on the smooth skin of the posterior part of the abdomen, around the vulva, and on the inner parts of the thighs (fig. 6). The eruptions were circinate, scaly, and with an erythematous periphery. The size of the lesions, which spread peripherally, ranged from 1 to 6 cm. or more in diameter. Some lesions coalesced, forming large irregular patches.

Trichophyton verrucosum (fig. 4) is a common dermatophyte of cattle, but occurs rarely in sheep and dogs.

Clinical Symptoms (*T. Verrucosum* Infection).—Cattle.—Young cattle are highly susceptible to this type of fungous infection. The skin of the head, neck, and around the tail has been attacked most frequently. The lower parts of the limbs remain uninvolved, as a rule, even in severe cases. The most common clinical symptom of ringworm in cattle is crustaceous and circinated tinea. It begins with small nodules which are hidden by the hair. Soon flat-topped, sharply defined, rounded areas develop, covered first with scales and later with heavy grayish white crusts. The lesions (fig. 7) steadily increase in size, often fuse and form larger, irregular patches. The hair of the affected areas becomes dry and brittle, breaking off above the crusts to leave short stumps. These crusts are usually thick, and when they are removed forcibly a moist, bleeding base is seen. After several weeks or months, if untreated, the crusts loosen and fall off leaving bald spots upon which desquamation continues. Healing of trichophytic skin lesions in cattle begins in the center. The skin itself is considerably thickened. There is itching at first and again during the final stages.

Sheep.—In sheep, the *T. verrucosum* has rarely been isolated. In adult sheep, it has

Fig. 7—Ringworm in cattle, caused by Trichophyton verrucosum.

appeared in the crusted form on the back, shoulders, neck, and chest. In lambs, the trichophytic lesions are chiefly localized on the head, around the eyes, and the ears.

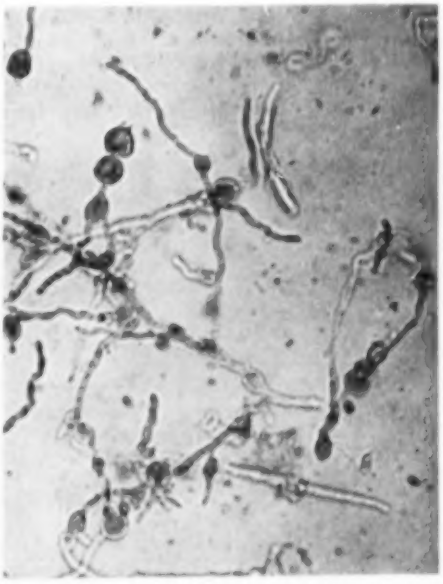


Fig. 8—Trichophyton schoenleini on Sabouraud's dextrose agar.

Fig. 9—Favus lesions in a dog, caused by Trichophyton schoenleini.

Dogs.—In dogs, the *T. verrucosum* has been found mainly in short-haired breeds, such as Boxers and Doberman Pinschers. The development of skin lesions starts with the formation of small papules and nodules partly hidden by erected hairs. Numerous round or oval, well-defined areas soon developed which are covered with scales, crusts, and broken hair stumps. The unpigmented skin of the affected regions shows a red discoloration, with itching generally absent. After healing of these deep skin lesions, the hair does not grow again because of hair follicle destruction, confirmed on biopsy of the affected skin.

Fig. 10—Favus lesions (white comb) caused by Trichophyton gallinae.

Clinical Symptoms (Faviform Trichophytons).—From the faviform group of the Trichophyton fungi, *T. schoenleini* (syn.: *Achorion schoenleini*) and *T. gallinae* (syn.: *Achorion gallinae*) have been isolated in animals and fowl.

Trichophyton schoenleini (fig. 8), which is the cause of "favus" in man, has been found also in animals, but relatively rarely. It occurs mainly in some Mediterranean areas. In America, it has been seen in individuals who have emigrated from those areas. Animals, mainly rabbits, mice, cats, and dogs, have contracted the infection from man. In Europe, few cases of favus have been described in horses and cattle; however, it is not improbable that cases described as "favus" were in reality trichophytic infections. The infectiousness of favus is comparatively great, especially among young animals of the same species. However, the favus infection may also spread among different species of animals or from animal to man or vice versa. Malnutrition and poor hygienic conditions of the skin are predisposing factors.

Small Animals.—In cats, dogs, and rabbits, the skin of the head, ears, and paws is usually affected. In advanced cases, the cutaneous lesions may appear on other parts of the body (fig. 9). In cats and rabbits, the infection tends to be localized on the ears, occasionally invading the external ear canal. The skin lesions are characterized by yellowish brown, cup-shaped, elevated crusts of various sizes, called scutula. After the removal of the crusts a reddish, moist base is seen. A characteristic odor, suggesting mold mingled with mouse urine, emanates from the crusts.

Fowl.—*Trichophyton gallinae* has been found in chickens, turkeys, canaries, and wild birds. It is more common among cocks than hens. The cutaneous lesions are found chiefly on the nonfeathered parts of the head, especially on the comb (fig. 10) and wattles in the form of small white crusts which appear like growths of mold (white comb). The crusts gradually spread over the entire surface of these structures, sometimes becoming thick. In severe cases, particularly in young birds, the lesions

may spread to the neck or even over the entire body surface. Itching is absent, especially in the early stages of the disease.

Pigs.—In pigs, ringworm lesions caused by Trichophyton sp. develop, as a rule, on the lower abdomen or medial surface of the thigh. They start as pimples which soon expand in rounded lesions 3 to 6 cm. or more in diameter. Their edges are reddish and often consist of small vesicles surrounding a scaly center. These lesions do not cause itchiness or irritation and, therefore, they are seldom seen unless the animal is lifted or is lying on its side. There are also no general symptoms and the skin lesions usually disappear spontaneously.

In young pigs, there is also a special type of ringworm-like lesions which resemble pityriasis rosea of man. The disease is characterized by numerous reddish, scaly patches, which are round, oval, or irregular in shape, covered with branny scales and which tend to heal in the center (fig. 11). These cutaneous lesions are sometimes preceded by general symptoms such as loss of appetite, vomiting, and diarrhea. The gastrointestinal symptoms usually disappear when the first skin lesions develop. The causative agent has not been found.

Fig. 11—Pityriasis rosea in a pig.

Course and Prognosis of Dermatomycoses

Considering the dermatophytic infections in animals from the standpoint of their course and prognosis, it is necessary to determine what predisposing causes take part in the development of the skin lesions, the degree and severity of the lesions, and what species produced the fungous infection.

The course and prognosis of dermatomycoses in animals differ considerably because the pathogenicity of the disease is variable. When proper treatment can be undertaken early, recovery may take place within a relatively short time. Advanced cases of ringworm in young animals in poor general condition sometimes take a severe course, and the prognosis should be guarded. Spontaneous recovery, on the other hand, may occur, especially when the lesions are small and the animals are mature, well fed, and kept in the sunshine. In deeper forms of the fungous infection, the hair loss may be permanent after the recovery from the skin lesions because of a complete destruction of the hair follicles. In general, the species of Microsporum and Trichophyton producing the ectothrix type of superficial infection are not difficult to eradicate in animals. The deeper, endothrix, type of ringworm always takes a longer time for treatment and recovery.

Treatment

The development and severity of dermatomycoses in animals often depends on various individual predisposing causes, such as age, nutrition, poor hygienic conditions, and on the species of the fungus present. Therefore, in addition to treating the affected animals externally, it is advisable to take care of nutritional, hygienic, and all other conditions. Feeds rich in proteins, good hygienic conditions, and sunshine may essentially support the treatment results.

The systemic application of iodine preparations, such as sodium iodide orally or intravenously, may be good supporting therapy, especially in severe fungous infections.

Before local treatment is begun, the long hairs should be clipped on and around the affected areas. If possible, the whole body should be clipped because many hidden lesions may be revealed. When the cutaneous lesions are covered with thick crusts, these should be removed by massaging with soft soap or oils.

For external therapy, there are many fungicides in the form of ointments, liniments, lotions, or sprays which may be employed. Many of them have been described.[2]

Iodine has been known for many years as one of the most potent and useful germicides. It acts against various microorganisms such as viruses, spores, bacteria, and even fungi. It has been used in the form of the tincture, Lugol's solution, ointments, and lotions. In large and small animal therapy, we have recently used newly developed iodine preparations in which the iodine is combined with certain types of synthetic detergents such as ethylene oxide condensates of polypropylene glycol. In this combination, it has been formulated as ointments or lotions of various concentrations and as shampoo (weladol*). This combination was found to be nontoxic and nonirritating for large animals as well as for dogs, cats, and rabbits. For treatment of ringworm occurring in both large and small animals, we have used ointments and lotions of approximately 5 per cent iodine, of various consistency depending on the molecular weight or the chain length of the detergent carrier. The softer ointments have been found to be more suitable for application. These "tamed" iodine ointments have been used in the treatment of infections of Microsporum and Trichophyton species in horses, cattle, dogs, cats, and monkeys. In cases in which the crusted condition of the lesions prevailed, the iodine was applied without any previous removal of the crusts. Three to four applications at two-day intervals have been sufficient in most cases. Only in deep infections was the iodine applied five times before the lesions cleared up completely. All horses, cattle, dogs, cats, and monkeys which received this treatment for ringworm recovered within 12 to 26 days without a relapse. Large areas have been treated at one time without toxic symptoms, and no local irritation has been noticed.

As mentioned above, many cases of *M. canis* infection showed fluorescence on hairs of areas without any skin lesions. Therefore, when the last ringworm lesions are treated, regardless to the fungus species, an iodine shampoo is used in a double wash-up procedure over the whole skin surface. The second application of iodine shampoo was made immediately following the first application. A single treatment has been found by ultraviolet radiation to be insufficient. In some cases of *M. canis* infection, after the first shampoo some hairs still have shown the fluorescence, but after the double wash-up procedure the fluorescence disappeared completely and did not recur. The shampoo always was applied over the whole body in dogs and cats, and no signs of any toxicity or skin irritation were observed.

For treatment of ringworm in horses (girth itch) caused by *M. canis*, we have used ortho-tack-wash (captan) solution applied by sponging or spraying of the affected areas.

The treatment of ringworm in cattle depends on the stage, on the size of the lesions, and on the thickness of the crusts. When the lesions are in the beginning stage, the above mentioned iodine preparations could be used in the form of ointments or lotions. In advanced cases, good results have been achieved with 10 per cent solution of chlorox. In severe cases, the external treatment has been supported by systemic treatment, with sodium iodide applied either orally or intravenously.

CONCLUSION

Veterinary mycology has made an essential progress in recent years, not only in diagnosis but also in treatment of various fungous infections. However, there are still many unsolved questions which should be studied through mutual cooperation of both human and veterinary medicine, because, to date, we do not know of any dermatophyte which could not be mutually transmissible.

References

[1]Conant, N. F., *et al.*: Manual of Clinical Mycology. Saunders Company, Philadelphia (1954): 417.

[2]Kral, F., and Novak, B.: Veterinary Dermatology. Lippincott, Philadelphia, 1953.

*Supplied by West Laboratories, Inc., Long Island City, N.Y.

More AVMA Convention Highlights

1955 Convention Sets New Record

All previous attendance records for AVMA conventions were shattered by the 3,715 registered for the Ninety-Second Annual Meeting in Minneapolis.

Official Registration Figures

The total registration of 3,715 was classified as follows:

Veterinarians	2,057	(55%)
Women	1,057	(29%)
Children	256	(7%)
Exhibitor representatives	233	(6%)
Students	71	(2%)
Guests	41	(1%)

Geographical Distribution

TABLE I—Regional Distribution of Registrants at the Minneapolis Meeting, Aug. 15-18, 1955

NORTH ATLANTIC STATES	
Maine	8
New Hampshire	2
Vermont	11
Massachusetts	24
Rhode Island	2
Connecticut	13
New York	106
New Jersey	25
Pennsylvania	75
Subtotal	266
EAST NORTH CENTRAL	
Ohio	138
Indiana	148
Illinois	303
Michigan	142
Wisconsin	309
Subtotal	1,040
WEST NORTH CENTRAL	
Minnesota	819
Iowa	410
Missouri	143
North Dakota	67
South Dakota	83
Nebraska	93
Kansas	88
Subtotal	1,703
SOUTH ATLANTIC	
Delaware	12
Dist. of Columbia	31
Maryland	41
Virginia	23
West Virginia	11
North Carolina	10
South Carolina	9
Georgia	18
Florida	23
Subtotal	178
SOUTH CENTRAL	
Kentucky	18
Tennessee	21
Alabama	32
Mississippi	4
Arkansas	4
Louisiana	17
Oklahoma	36
Texas	79
Subtotal	211
WESTERN	
Montana	27
Idaho	1
Wyoming	14
Colorado	34
New Mexico	6
Arizona	12
Utah	15
Nevada	2
Washington	27
Oregon	10
California	79
Subtotal	227
OTHER COUNTRIES	
Canada	71
Philippines	—
U. S. Possessions	6
B. W. I.	2
England	1
Ecuador	1
Iran	3
Japan	1
Mexico	2
New Zealand	2
Pakistan	1
Subtotal	90
GRAND TOTAL	3,715

The five states with highest numbers of registrants were: Minnesota, 819; Iowa, 410; Wisconsin, 309; Illinois, 303; Indiana, 148.

Every state in the Union was represented at Minneapolis. Arranged in the order of number of registrants, the regional breakdown shows:

West North Central	1,703
East North Central	1,040
North Atlantic	266
Western	227
South Central	211
South Atlantic	178
Other countries	90
	3,715

Reports — Group Conferences Held During AVMA Meeting in Minneapolis

American Board of Veterinary Public Health

The Sixth Annual Meeting of the American Board of Veterinary Public Health was held at the Leamington Hotel in Minneapolis on August 15, with Dr. H. J. Stafseth presiding. Three candidates were examined for certification.

Amendments to the constitution and bylaws were approved. The new provisions make possible the examining of applicants in any veterinary or public health school at any convenient time, thereby eliminating the need for travel to a central location at a specific time.

Dr. Frank M. Lee, public health veterinarian for the State of South Carolina, was welcomed as a new fellow of the board.

The $100 U. S. Government Bond, which the board awards each year to the junior or senior student composing the best thesis on "Veterinary Public Health," was awarded to Mr. William E. Bates, a junior at Ohio State. The award will be continued for one more year.

The Andrew Leslie MacNabb Award was conferred upon Dr. Lawrence Elwood Gray, of Truro, Nova Scotia, and the Claude Bryan Award was won by Dr. Joseph L. Sewell of Crown Point, Ind.

The following fellows were elected to the governing council for the periods indicated: Colonel Jack Hempy, 1953-1956; Dr. James Scatterday, 1953-1956; Dr. Frank A. Todd, 1954-1957; Colonel Robert Hummer, 1954-1957; Dr. Raymond Helvig, 1955-1958; and Colonel John Nettles, 1955-1958.—*Martin D. Baum, Secretary.*

American College of Veterinary Pathologists

A symposium on the training of veterinary pathologists was held on August 15. It was sponsored by the American College of Veterinary Pathologists' Committee on Education. Dr. Wayne H. Riser served as moderator. Dr. W. H. Eyestone of the National Institutes of Health, Bethesda, Md., spoke on "The Availability and Need for Veterinary Pathologists." He suggested means of stimulating the interest of young graduates in veterinary pathology and ways in which they could secure advanced training.

Dr. E. P. Bell, University of Minnesota, spoke

on "Current Training Programs for Human Pathologists." He pointed out the similarity of pathology in man and in other species of animals, and emphasized that veterinary and medical students did equally well in the same basic pathology courses. Dr. C. L. Cole, chairman of the group's Committee on Education, discussed a survey of American universities and colleges which grant advanced degrees in veterinary pathology. The survey indicated that there are at least twice as many available positions as there are qualified pathologists. Lt. Colonel T. C. Jones, Armed Forces Institute of Pathology, Washington, D. C., described the training program for veterinary pathologists at the Institute and the research projects in which the trainees participate. The latter includes civilian veterinarians as well as military personnel.

Dean W. R. Krill of the College of Veterinary Medicine, Ohio State University; Dr. Carl Brandly, University of Wisconsin; Lt. Colonel Fred B. Maurer, Washington, D. C.; and Dr. J. H. Sautter, University of Minnesota, also discussed the training of veterinary pathologists. The Council met later to consider applicants for the 1955 qualifying examination to be given in Chicago in November. —*T. C. Jones, Secretary.*

American Veterinary Exhibitors Association

The American Veterinary Exhibitors Association held its annual meeting at the Radisson Hotel, Minneapolis, on Aug. 14, 1955.

President C. M. McCallister introduced Dr. J. G. Hardenbergh, executive secretary of the AMVA, who outlined a plan for future meetings that had been set by the Executive Board and extended his appreciation to the exhibitors association for its support and cooperation.

New officers elected were: executive committee—Dr. Carl J. Norden, Jr., Norden Laboratories, president; Dr. Robert H. Hollis, Abbott Laboratories, vice-president; B. L. Hill, Sharp and Dohme, Division of Merck and Co., Inc., secretary-treasurer; also D. M. Nicholson, Nicholson Manufacturing, Inc.; and C. M. McCallister, Jensen-Salsbery Laboratories, Inc. Advisory committee—W. E. Schwartz, Wilson and Company, and Dr. J. R. Harris, S. E. Massengill Co.

An outline of recommendations to serve as a guide for veterinary medical association officials in planning, preparing, and conducting exhibit programs was adopted. This will be mailed to secretaries of veterinary medical associations for whatever assistance it may render to the mutual benefit of the association and the exhibitors.

The exhibitors association approved a contribution to the Research Fund of the American Veterinary Medical Association of 10 per cent of the treasury fund in 1956. The amount will be based on the 1956 total treasury before dues are received.

Conference of American Veterinary Radiology Society

The American Veterinary Radiology Society held its annual meeting at the Radisson Hotel on Aug. 15, 1955. With Dr. M. A. Emmerson presiding, provisions for enabling participation in activities of the organization by those not qualified for full membership were discussed. Both technical sessions and business meetings were opened to AVMA membership at large. A committee was established

Dr. B. A. Pomeroy (center), 94 years old, is still practicing with three of his sons in St. Paul. His son, Dr. B. S. Pomeroy (left), of the School of Veterinary Medicine, University of Minnesota, and President A. H. Quin are shown with him at the Closing Session of the AVMA meeting in Minneapolis.

to investigate the advisability of sponsoring a symposium on veterinary radiology.

The technical sessions were attended by 30 members and guests. Errors in radiographic diagnosis were discussed by Newton B. Tenille and reports of original research in veterinary radiology by Dr. Emmerson. At a symposium on radiological examination of the thorax, Dr. Gerry B. Schnelle presented cases and review material used in the detection of neoplasms; and Dr. Donald H. Clifford gave a paper on mediastinal injury in the dog. A discussion on exposure factors and examination of the thorax in equine and bovine animals was presented by Dr. Francis A. Spurrell.

A panel, consisting of Drs. William C. Glenney, T. G. Hage, Myron A. Thom, Halver Vermund, and moderated by Dr. Emmerson, discussed the effects of radiation on normal and abnormal tissues. The use of radioisotopes as well as conventional sources of radiation was discussed.

The following officers were elected: Dr. William C. Glenney, Pennsylvania, president-elect; Dr. Francis A. Spurrell, Minnesota, secretary-treasurer. Dr. William C. Banks, Texas, was installed as president at the close of the business meeting.—*Francis A. Spurrell, Secretary.*

American Society of Veterinary Physiologists and Pharmacologists

On August 10-13 inclusive, just prior to the AVMA convention, a workshop conference of the American Society of Veterinary Physiologists and Pharmacologists was held at the University of Minnesota, School of Veterinary Medicine, St. Paul.

The topic of this conference was "Research Tools and Techniques," and it included sessions on rumen physiology, bovine uterine motility patterns, veterinary toxicology, the adrenal gland and ketosis, and an afternoon in the physiology laboratories of the University of Minnesota Medical School. The group passed a resolution recommending that veterinary journals and teachers follow the lead of the American Medical Association in the use of generic terms for drugs.—*C. M. Stowe, Secretary*

Army and Air Force Veterinary Officers

Approximately 75 Army and Air Force veterinary officers attended the fifth annual meeting of military veterinarians held in connection with the Ninety-Second AVMA Convention, August 16, at the Radisson Hotel.

Brig. Gen. Elmer W. Young, chief of the Veterinary Division, Office of the Surgeon General, Department of the Army, opened the meeting with a review of interesting developments which occurred throughout the past year affecting the Army Veterinary Service. This review was highlighted by the part being played by military veterinarians in activities involving atomic energy and its development. These activities included establishment of a veterinary radiological health school at Oak Ridge, Tenn., assistance in atomic disaster aid programs, and studies of radiation effects on food and animals.

Brig. Gen. Wayne O. Kester, assistant for veterinary services, Office of the Surgeon General, Department of the Air Force, then gave a progress report and summary of the important events and actions taken which influenced the Air Force Vet-

The 34 physiologists and pharmacologists attending the workshop conference from the several veterinary institutions in the United States.

First row (front, left to right) — Drs. L. M. Jones, Wm. Medway, E. A. Hewitt, H. H. Dukes, P. W. Burns, C. F. Cairy, I. Rosoff, Roy Nichols.

Second row (left to right) — Drs. H. E. Dziuk, P. Klavano, L. C. Payne, J. Grace, J. Sampson, R. Johnston, L. L. Nangeroni, M. J. Swenson, J. P. Sullivan.

Third row (left to right) — Drs. J. C. Trace, J. B. Miller, D. D. Goetsch, P. B. Hammond, E. C. McMannus, A. D. Rankin, E. N. Bergman, R. Perdomo, C. E. Stevens.

Last row (left to right) — Drs. L. E. McDonald, Wm. Dickson, Lt. L. Williams, Drs. A. F. Sellers (president), Wm. Pounden, L. L. Phaneuf, A. L. Good, C. M. Stowe (secretary).

erinary Service. He stressed the role of the veterinarian in medical research support and in public health activities.

The meeting was then opened for discussion and all present were called upon for remarks which were of interest to the group.

All veterinary officers, both active and inactive, are invited to attend these annual meetings which provide an excellent opportunity to exchange information and meet officers in other branches of the service.—*Wayne O. Kester.*

Association of Deans of Veterinary Colleges

In the absence of President Leasure, who is in India, Vice-President W. A. Hagan presided at the meeting of Deans of Veterinary Colleges. He introduced Dr. Alexander Robertson, Royal (Dick) Veterinary College, University of Edinburgh, who is president of the British Veterinary Medical Association; also Dr. E. E. Chamberlayne, WHO, Washington, D. C., who reported on the need of Central and South American schools of veterinary medicine for assistance from the North American schools. Other speakers were Drs. R. E. Rebrassier, secretary of the AVMA Council on Education; H. E. Kingman, Jr., assistant executive secretary of the AVMA; and J. G. Lafortune, Maniwaki, Que., who represented Dean Labelle of the School of Veterinary Medicine, Province of Quebec.

Deans who spoke included R. S. Sugg, I. A. Merchant, E. C. Stone, C. F. Clark, and W. T. S. Thorp.

The present officers were re-elected.—*A. H. Groth, Secretary.*

Conference on Care of Laboratory Animals

The scientific session of the Committee on Veterinary Care of Laboratory Animals was held on August 15, with 32 veterinarians representing research and medical branches of the Armed Forces, state and federal agencies, universities, and private enterprise. Deans and members of the curriculum committees of the veterinary schools, and members of the Council on Education were also present.

Papers were presented by Major Benjamin D. Fremming, of the Radiobiological Laboratory, Austin, Texas, on "Common Disease Conditions of Monkeys," and Dr. Charles A. Griffin, State of New York Department of Health, Albany, N. Y., on "Can Pelleted Feed Free from Viable Salmonella Microoganisms Be Supplied Commercially for Laboratory Mice"? (read by Dr. Donald Dean).

An informal discussion was held on the question: "What method can be employed to improve the training given veterinary students in the care of animals"? It was suggested that a course be added to the veterinary curriculum covering this relatively new field of specialization. Although the majority of those in attendance felt that such additional training would be highly desirable, those in charge of establishing curriculum could not see how any additions could be made to the present crowded schedules.

A business meeting attended by Drs. Brewer, Cass, Flynn, and Major Fremming was held immediately after the close of the scientific session.—*R. J. Flynn, Session Chairman.*

Industrial Veterinarians Association

The Industrial Veterinarians Association was organized during a meeting in the Radisson Hotel on Aug. 16, 1955. With 35 veterinarians associated with industry in attendance, a constitution was adopted and officers elected. The association is open to AVMA members associated with industry (pharmaceutical, biological, chemical, investigational). The officers elected were: Drs. Mark Welsh, Pearl River, N. Y., president; Robert McCarty, Alvarado, Texas, president-elect; Edward Batte, Haddonfield, N. J., secretary; and J. B. A. LaSalle, New Castle, Ind., treasurer. The executive committee consists of Drs. Welsh, McCarty, George T. Edds of Fort Dodge, Iowa, and K. Maynard Curts of Kansas City, Kan.

Veterinarians employed by industry may contact the secretary for copies of the constitution and proposed agenda of discussion for the next meeting at San Antonio.—*Edward G. Batte, Secretary.*

Conference of Livestock Sanitary Officials

The National Assembly of Chief Livestock Sanitary Officials held a meeting on August 15 at the Radisson Hotel with Dr. A. P. Schneider presiding. Twenty-six states and Canada were represented.

A joint meeting of the National Assembly and the Federal Veterinarians was held August 17 with Drs. R. L. West and C. D. Van Houweling acting as co-chairmen. This meeting was attended well by both state and federal personnel.

Subjects of most interest were the accelerated brucellosis programs, national ear-tagging or other cattle identification plans, and dealing with emergency disease outbreaks.—*M. N. Riemenschneider, Secretary.*

Veterinary Nutritionists

The first meeting of the American Association of Veterinary Nutritionists was held in the Radisson Hotel on August 15, with Dr. Morris Erdheim, chairman of a special committee on organization, presiding. Dr. W. D. Pounden told how the movement to form the association originated. Four committees were then appointed, with the following chairmen: constitution, Dr. R. E. Lubbehusen; membership, Dr. Spencer H. Morrison; industry contact, Dr. Morris Erdheim; and nutrition publications, Dr. R. C. Klussendorf.

Problems discussed included limitations on membership, the relationship of the group to the AVMA, and the functions of the association. The need for speedy release of technical information led to a suggestion that members file such infor-

mation with the central organization, which could then distribute it in the form of releases. The differences between "livestock nutrition" as opposed to the "maintenance of health aspects" of nutrition were discussed; also the relationship between practicing veterinarians and the feed industry.

On the motion of Dr. Mark Morris, the group voted that the organization should become a component part of the AVMA in so far as this is possible. After discussion of the advisability and problems connected with the medication of feeds, the group adjourned. Approximately 60 were in attendance.—*W. D. Pounden, Acting Secretary.*

Conference of Veterinary Parasitologists

The fourth annual conference of veterinary parasitologists was held at the Radisson Hotel on August 15, with one session in the afternoon and another in the evening. Thirty-two attended one or both sessions. After considerable discussion, it was decided that formal organization (but not a specialty board) of workers in veterinary parasitology would be formed, with a committee to be appointed to present a proposed organization charter at the conference held at the time of the 1956 AVMA meeting.

Most of the time was devoted to a discussion of the teaching of veterinary parasitology in the colleges of veterinary medicine, with particular emphasis on the amount of course work, its location in the curriculum, and teaching methods.—*W. S. Bailey, Chairman.*

Conference of Editors

The conference of editors was held in the Radisson Hotel, Monday evening, August 15, with about 50 in attendance.

The general subject was "The Use and Abuse of Veterinary Medical and Related Terms." The entire discussion was informal and was concluded with a spirited round-table discussion. The chairman called on Drs. A. G. Karlson to discuss medical dictionaries and terms which should be added to better adapt them for veterinary use; C. H. Cunningham and C. A. Brandly to discuss the proper use of technical terms, especially those used in research; and C. H. Covault to discuss clinical terms. Since empiricism is still a considerable factor in clinical terminology, this phase of veterinary literature particularly needs study.

Dr. L. Meyer Jones was invited to report on a recommendation by the Society of Veterinary Physiologists and Pharmacologists that the example set by the American Medical Association in the use of generic names for drugs be followed.—*W. A. Aitken, Chairman.*

Conference of State and Federal Veterinarians

Representatives of the state, federal, and Canadian governments met on Wednesday, August 17, to discuss diseases such as brucellosis, tuberculosis, vesicular diseases, the mucosal disease complex, bluetongue, scabies, and scrapie. Ways and means of conducting the expanded brucellosis program with the funds available were considered.

With regard to tuberculosis, in addition to locating new foci of the disease by tracing the origin of animals found at slaughter to be tuberculous, suspected tuberculous lesions from nontested animals are being studied in U.S.D.A. pathology laboratories. This has resulted in the elimination of considerable unnecessary testing in cases where the suspected lesions are found to be due to other granulomatous conditions.

Other items of national interest discussed included: disease reporting, animal identification, meat inspection, the virus-serum program, emer-

The conference of editors was held on Monday evening, August 15, during the Minneapolis meeting. Dr. W. A. Aitken (standing), editor-in-chief of AVMA publications, presided.

gency disease organization, and accreditation of practitioners. Leading the discussions were Drs. C. K. Mingle, Asa Winter, A. F. Ranney, C. H. Pals, R. J. Anderson, F. A. Todd, O. E. Herl, all of Washington, D. C.; J. E. Stuart of California, and J. R. Hay and R. L. Knudson of Ohio. The meeting was presided over by co-chairmen, Drs. C. D. Van Houweling, director of Livestock Regulatory Programs of Agricultural Research Service, Washington, D. C., and R. L. West, state veterinarian of Minnesota, who substituted for Dr. A. P. Schneider, state veterinarian of Idaho.—*C. D. Van Houweling.*

Conference of Zoo Veterinarians

Thirteen veterinarians were present at the meeting of zoo veterinarians on Tuesday, August 16. Dr. Patricia O'Connor had requested Dr. A. W. Sylstra of the San Diego Zoo to serve as secretary.

A report on hyperplasia of the pylorus in 2 female Gelada baboons at the San Diego Zoo was discussed. There was considerable discussion on the topics of restraint, diagnosis, and treatment of zoo animals. It was agreed to have informative notes circulated regularly among the members.

Major B. D. Fremming, Radiobiological Laboratory, Austin, Texas, and Dr. Jules Cass, Kettering Laboratory, University of Cincinnati, led a discussion on the development and maintenance of a colony, or colonies, of *Macaca mulatta* monkeys. They stated that research is using approximately 120,000 of these monkeys annually.

All present expressed their appreciation in a note to Dr. Patricia O'Connor for her patience and work while secretary for the group.—*A. W. Sylstra, Secretary.*

Alumni Meetings in Minneapolis—August 17

Alabama Polytechnic Institute

A total of 56 people attended the A.P.I. alumni dinner. Dr. J. A. Smith ('48), of South Minneapolis, served as chairman. He introduced Dean R. S. Sugg who reported briefly on recent changes in the faculty, completed and anticipated additions to the physical plant of the veterinary school, and the progress made in the research program with the organization of the Animal Disease Research Department of the Experiment Station, of which Dean Sugg serves as head. Dr. B. T. Simms ('11), director of Livestock Research, ARS, U.S.D.A., was recognized on the occasion of his having received the Twelfth International Veterinary Congress Award.

Some of the highlights of the successful football season of 1954 were reviewed, and a number of optimistic predictions were made for the coming season. After the singing of the Auburn Alma Mater and a loud "war eagle," the meeting adjourned to the Radisson Hotel for the president's reception.—*W. S. Bailey.*

University of California

Two loyal and enthusiastic alumni, in company with Dean Donald E. Jasper, joined in a banquet for smaller groups under the able toastmaster, Dr. Fred Driver, of St. Paul.

Young graduates of several recently established schools enjoyed the company of older graduates of private schools of years ago. We were especially honored by the company of Dr. B. A. Pomeroy, of St. Paul, an 1883 graduate of Montreal, and now in his seventy-third year of practice.—*D. E. Jasper.*

Colorado A. & M. College

The Colorado A. & M. alumni banquet at the Radisson Hotel was attended by approximately 200 persons. Dr. L. T. Ausherman, master of ceremonies, introduced Dr. Floyd Cross, president of the AVMA and dean of the School of Veterinary Medicine, as speaker of the evening.

Dr. Cross introduced distinguished guests and faculty members of Colorado A. & M. and discussed recent changes of the physical plant at the college, as well as probable future developments. Comments were also made regarding the quality of the research programs.

Renewing acquaintances with fellow "Aggies" made the evening a huge success.—*Glenwood P. Epling.*

Cornell University

The Cornell alumni met at the Hotel Curtis with approximately 65 in attendance. Dr. Ray Klussendorf presided and the singing was led by Dr. Cliff Carpenter. The speaker was Dean W. A. Hagan who told of recent developments on the campus, of which the construction of the new veterinary buildings was of greatest interest. His talk was supplemented with a 25-minute motion picture film depicting all members of the present faculty. This film was a copy of one that was included with other documentary material in the cornerstone of the new school.—*W. A. Hagan.*

Iowa State College

The Iowa State College alumni banquet was held at the Nicollett Hotel with about 450 in attendance, thus making it the largest number of Iowa State veterinary alumni ever to have been gathered together at one time.

Dr. John Dunnwald ('43), of Waterville, Minn., chairman of the dinner, introduced Dean I. A. Merchant who, in turn, introduced the members of the faculty in attendance and discussed various matters pertaining to the School of Veterinary Medicine.

He briefly outlined the status of building improvements which included the renovation of the clinic building which is to house the anatomy department; the construction of the diagnostic laboratory; and the remodeling of the old barracks building for obstetrics and experimental surgery.

The Iowa State College Alumni Achievement

Fund was described and Dean Merchant enumerated the various projects of the Division of Veterinary Medicine which are supported from this fund.

Dr. Ted Bartley ('33), veterinary medical representative on the Iowa State College Athletic Council, spoke about the athletic prospects of the college for the coming year.—*I. A. Merchant.*

Kansas State College

The Kansas State College alumni dinner was held at the Francis Drake Hotel with 262 persons present. In the absence of Dean E. E. Leasure, Dr. M. J. Twiehaus, of the pathology department, presided and spoke briefly on school activities during the past year, and showed some pictures of the campus and of the staff.

Recognition was given to Dr. C. A. Brandly ('23); Brig. General E. W. Young ('25), V. C., U.S. Army; and Brig. General Wayne O. Kester ('31), assistant for Veterinary Services, U.S. Air Force, for receiving the first college service awards in recognition of outstanding services in their particular field. These awards had been presented at the fiftieth anniversary of Kansas State College, June 2, 1955.

Tribute was paid to Dr. C. W. Bower ('18), for receiving the 1955 AVMA Award; and also to Dr. W. F. Irwin ('33), Tulsa, Okla., who is president of the American Small Animal Hospital Association for the coming year. The alumni gave Dr. and Mrs. John Burt (ONT '1885, OSU '1905) a standing ovation for their long years of service on the faculty at Kansas State College.

Brig. General Wayne O. Kester, president-elect of the AVMA, was called upon for a few remarks. After the meeting terminated the alumni attended the president's reception—*M. J. Twiehaus.*

Michigan State University

A dinner meeting was held at the Hotel Normandy with 204 people in attendance. Of this number, at least 150 were veterinary graduates.

Dr. Charles Gale ('52) acted as chairman and presented Dr. H. J. Stafseth ('17) who thanked the alumni present in behalf of Dr. R. A. Runnells ('16) and himself for their participation in the program, held April 28, commemorating the retirement of these two staff members.

Dean C. F. Clark reported on events on the Michigan State campus during the year, including the celebration of the centennial anniversary of the institution, the symposium conducted by the school in June, the Runnells-Stafseth recognition celebration in April, and the official name change which became effective July 1. Alumni were interested to learn that their alma mater is now officially entitled Michigan State University and their school, the College of Veterinary Medicine.—*C. F. Clark.*

University of Minnesota

Approximately 130 people attended the Minnesota alumni dinner at the Curtis Hotel.

Dr. John F. Larson ('52), president of the Minnesota Veterinary Alumni Association, welcomed the guests to the dinner.

Dr. W. T. S. Thorp, dean since August, 1954, gave a talk of great interest to the alumni in outlining changes involving both the staff and the physical plant during the past year. He also covered proposed changes which are expected to be placed into effect during this next year.

Guests included Dr. H. C. H. Kernkamp, former dean of the School of Veterinary Medicine at Minnesota, now president of the Minnesota State Veterinary Medical Society, and Dr. C. F. Schlotthauer, member of the Executive Board of the AVMA, and their wives.—*G. O. Schubert.*

University of Missouri

Forty-one alumni, their wives, guests, and faculty members were present at the alumni dinner and meeting held at the Leamington Hotel.

All of the six classes graduated by the School of Veterinary Medicine, University of Missouri, were represented. The class of 1956 representatives of the student chapter and auxiliary were also present.

Dr. and Mrs. P. L. Nelson, of Minneapolis, were responsible for local arrangements, and Dr. Nelson ('53) welcomed the group to the Twin Cities. Dean A. H. Groth reported briefly on the developments on the campus.—*A. H. Groth.*

Oklahoma A. & M. College

The second Oklahoma A. & M. College alumni dinner was held at the Francis Drake Hotel. The enthusiasm and cordiality of the 20 persons who attended more than compensated for the small number. Dean H. W. Orr reported informally on the progress of the School of Veterinary Medicine and described briefly the plans for the addition to the veterinary medical building. The alumni discussed their experiences since they had left the School and plans for the dinner in connection with the meeting next year.—*H. W. Orr.*

University of Pennsylvania

One hundred were present at the banquet for the alumni and their wives at the Radisson Hotel. Dr. Frederick H. Bathke ('50) presided and introduced many that were in attendance, including Dr. John G. Hardenbergh ('16), executive secretary of the AVMA; Dr. Samuel F. Scheidy ('29), chairman of the Executive Board of the AVMA; and Dr. Gerry Schnelle ('26), immediate past-president of the Alumni Society.

Brig. General James A. McCallam (Ret.) ('17), president of the Alumni Society, indicated that he was hopeful during his term of office of initiating a few changes pertaining, particularly,

to our annual conference dinner and alumni day held each June. Dean M. W. Allam spoke on the veterinary school and on some of its future plans.

The meeting was concluded in ample time to attend the president's reception.—*M. W. Allam.*

Texas A. & M. College

Under the direction of Drs. C. O. and P. C. Enge (both '39), the Texas alumni banquet was held on the Minnesota Terrace of the Nicollet Hotel. More than 100 people attended, including Dr. and Mrs. W. G. Brock (OSU '11) who have been "adopted" by the Texas contingent. The toastmaster, Dr. Raymond H. Hander ('38), called on Dr. Brock to open and close the after-dinner program by leading the group in singing. Informal talks were given by Dean W. W. Armistead ('38) of the School of Veterinary Medicine and by Dr. Paul B. Blunt ('38), executive secretary of the Texas Veterinary Medical Association.—*W. W. Armistead.*

Washington State College

The Washington State College alumni dinner was held at the Leamington Hotel with 48 alumni present.

Dean E. C. Stone discussed improvements made at the College of Veterinary Medicine during the past year and, in particular, the construction of a new x-ray room and the installation of new therapeutic and diagnostic x-ray units.

Dean Emeritus E. E. Wegner spoke on the improvements made in veterinary education during the past decade and expressed the hope that this improvement would continue to keep pace with the rapid advancements taking place in the various fields of science. Colored movies of the W. S. C. campus, made by the Williamses when they were doing graduate work, were shown by Mrs. Dorothy Williams. Dr. Paul Klavano ('44), of the Department of Veterinary Physiology and Pharmacology, showed a series of kodachrome slides illustrating improvements on the veterinary campus.

The program was concluded by group singing of W. S. C. songs led by Dr. Ray Bradbury ('41), of Mount Vernon, Wash.—*E. C. Stone.*

An Erysipeloid Review

Of 500 persons treated for erysipeloid at Denver in 30 years, 260 were packing-house employees, 144 worked in rendering plants, 84 handled hides, and a few worked in butcher shops, restaurants, or fish stores. Nearly all had hand infections with a history of a small cut which did not bleed or of an abrasion. After two to seven days, itching, throbbing, tingling, tenderness, and swelling developed. Usually there was a red spot on the finger, then a characteristic purplish rash which developed and spread slowly. The condition often extended to the back of the hand but never above the wrist. Lymphangitis and adenitis were present in 182 cases and arthritis in 29. Relapses occurred in 68. Penicillin was most beneficial but achromycin or terramycin® were also effective. Sulfonamides and streptomycin were without benefit.—*J.Am.M.A., April 9, 1955.*

Fewer Dairy Herds in Wisconsin

From 1945 to 1954, the number of dairy herds in Wisconsin dropped 18 per cent. In the same years, the number of farms also declined 11 per cent but the number of herds of 20 cows or more increased from 41 per cent to 53 per cent. The total dairy cattle population is larger.—*Hoard's Dairyman, June 25, 1955.*

Americans Eat More Meat

Compared to the late 1920's, the average American eats 19 per cent more meat, 12 per cent more poultry, 15 per cent more eggs, and 7 per cent more dairy products, despite a 50 per cent drop in butter eating. He eats over 30 per cent less flour, cereal, and potatoes, and 11 per cent less sugar.—*Trends, Central National Bank, Chicago, Sept. 22, 1955.*

Human Infection with Pleuropneumonia-like Organisms

Pleuropneumonia-like organisms are well known as animal pathogens, but there has been little evidence that strains isolated from man could reproduce disease. Four cases are reported from London (*Lancet 1*, 1955:276), 2 of puerperal sepsis, 1 pyosalpinx, and 1 postoperative empyema. Three recovered following chlortetracycline therapy after other treatment had failed. Specific PPLO antibodies developed to a maximum at the third week of infection, then fell. No antibodies were found in control patients.—*J.Am.M.A., July 16, 1955.*

Debeaking chickens for the broiler market resulted in 11.4 per cent more grade A birds in a research project in Alabama. It controlled feather-picking, thus making a more attractive carcass.—*Institute Am. Poult. Indust., Aug. 24, 1955.*

Kemithal Sodium as a General Anesthetic for Dogs

JOSE B. ARAÑEZ, D.V.M., and TOMAS F. FORTEZA, D.V.M.

Quezon City, Philippines

THE SEARCH for a more satisfactory general anesthetic in veterinary surgery has long engaged the attention and interest of anesthesiologists and surgeons. Unfortunate accidents seem to be equally divided between the improper choice and injudicious use of an anesthetic.

"Kemithal"* sodium is one of the newest locally available general anesthetics for dogs. Few satisfactory general anesthetics for dogs are available in the Philippines.

In 1950, Parry claimed that thialbarbitone sodium (kemithal) was satisfactory for an anesthesia, lasting about 15 minutes in dogs and cats when administered intravenously in 10 per cent solution in doses ranging from 30 to 45 mg. per pound of body weight as cited by Jones.[1] Jones further reported that the duration of its action was intermediate between the short-acting and ultra short-acting barbiturates.

Edds and Trace[2] reported the use of kemithal sodium in doses varying from 20 to 50 mg. per pound of body weight given intravenously in 10 per cent solution for general anesthesia in a series of 60 dogs. According to these authors, Seneviratne and Pillai recommended the following dosage schedule: "Below 10 lb. of body weight, 30 mg./lb.; from 10 to 30 lb., 20 to 30 mg./lb.; from 30 to 50 lb., 15 to 20 mg./lb.; over 50 lb., 15 mg./lb." The duration of anesthesia varied from 15 to 45 minutes, and was continued up to 90 minutes by subsequent injections of one third the original dose. Also, Beijers gave 6 to 12 ml. of the solution and the duration of anesthesia averaged about two hours.

Dr. Arañez is an instructor in the Department of Veterinary Medicine and Surgery, College of Veterinary Medicine, University of the Philippines, Diliman, Quezon City. Dr. Forteza is a recent graduate from the same college.

This work was conducted in the Department of Veterinary Medicine and Surgery, College of Veterinary Medicine, University of the Philippines, from Aug. 18, 1954, to Feb. 1, 1955.

The authors gratefully acknowledge the suggestions given by Dr. L. M. Yutuc, head of the department of Veterinary Medicine and Surgery, and Dr. A. C. Gonzaga, head of the Department of Veterinary Physiology and Pharmacology, from the same college.

*Kemithal sodium, a product of Imperial Chemical Industries, Ltd., Manchester, England, was supplied through the courtesy of Wise and Co., Inc., Manila, Philippines.

MATERIALS AND METHODS

A total of 38 native dogs of both sexes, varying from 11.88 to 45.32 lb. in weight and from 6 to 72 months in age, were used in this experiment. The dogs were fed twice daily, and for a week before the trials fecal and other examinations were made on each dog. Only those free from parasites and other diseases were used.

The anesthetic, kemithal sodium, is a hygroscopic powder, readily soluble in water. The 10 per cent solution has a pH of about 10.6, and the aqueous solutions are stable for a week when stored at ordinary refrigerator temperatures.

Daily for two days and again five minutes before the actual experiment, the temperature, pulse, and respiratory rate were recorded. The dogs were fasted 16 to 24 hours before the experiment to simulate actual surgical condition. Each dog was muzzled and restrained on its side on the operating table and the site of intravenous injection was prepared. The powdered anesthetic was dissolved immediately before administration.

After 20 dogs had been used, the therapeutic doses were computed and expressed in cubic centimeters per pound of body weight. In this study, 20.0 mg., or 0.2 ml. of the 10 per cent solution, was chosen as the minimum therapeutic dose.

To determine the toxic dose, 5 dogs were each given 41 to 46 mg. of the drug per pound of body weight. To find the lethal dose, each of 5 dogs was injected until respiratory arrest was observed. When the animal died immediately or within 40 minutes after the administration, the amounts given were considered lethal.

In all intravenous injections, the rate of administration was 2 cc. per minute. The temperature, pulse, and respiratory rate of each dog was recorded at five-minute intervals during the stage of surgical anesthesia and of recovery. Observations were also made on the physical changes in the animal and the duration of the stages of induction, surgical anesthesia, and recovery. In the absence of corneal and pedal reflexes, the skin, ears, tail, and muscles of the abdomen were pinched with artery forceps to determine the depth of surgical anesthesia. The recovery period was that period from the time the pedal reflex, corneal reflex, and consciousness appeared until the animal stood.

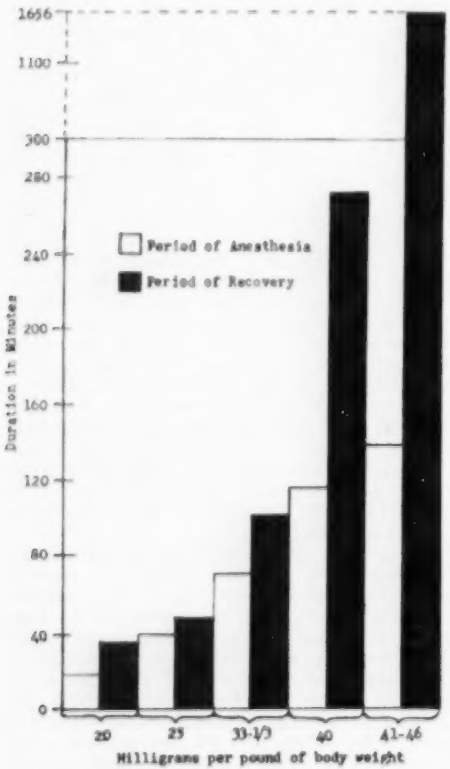
Eight actual surgical operations were done under kemithal anesthesia to evaluate four anesthetic

dosages, using 2 dogs per dose. The duration of surgical anesthesia was recorded to determine whether surgical operations alter the depth of anesthesia. The duration of recovery was not recorded since hemostatics, cardiac and respiratory stimulants, and dextrose-saline injections were given to shorten the period of recovery. Dicrysticin† was given to combat postoperative infection.

During the postexperimental period, the dogs were confined for a ten-day observation period before being discharged or painlessly destroyed. The same procedure was followed for the actual operative cases as for the experimental group, with emphasis given to the healing of the wounds and to any untoward or unphysiological manifestations exhibited.

DISCUSSION

During the induction period, the therapeutic doses caused only slight salivation in some dogs and almost total absence of the corneal reflex in all. The visible mucosa was congested. Excitement was totally absent. The respiration usually abruptly stopped for several seconds, then became deep and regular. The average duration of the stage of induction per dose of drug was 12 seconds for 0.2 ml. of kemithal; nine seconds for 0.25 ml.; ten seconds for 0.33 ml.; and six seconds for 0.4 ml.



Graph 1—The average duration of surgical anesthesia and recovery recorded in 25 native dogs given various doses, intravenously, of 10 per cent kemithal sodium solution.

The pupils contracted as soon as the stage of surgical anesthesia was reached, and the pulse became strong and regular. As the dosage increased, the pulse rate average increasing from 100.23 to 137.45 per minute, the respirations decreased from an average of 21.52 to 12.28, and the temperature readings also decreased. Seven dogs showed a slight salivation. The relaxation of the voluntary muscles was excellent. The anal sphincter was relaxed but there was no defecation or urination while the pedal and corneal reflexes were absent. The duration of surgical anesthesia ranged from 16 to 128 minutes as dosages increased, being 19.4, 39.6, 70.2, and 116.4 minutes, respectively (graph 1).

In the recovery stage, the pedal reflex exhibited by the stretching and contraction of the limbs appeared first, followed by the corneal reflex. There was a slight salivation in 6 dogs, profuse salivation and slight excitement in another, and dilatation of the pupils in all dogs. Recovery was smooth, with slight struggling in only 2 dogs. The duration of recovery ranged from 30 to 330 minutes, increasing with the dosage and averaging 36.0, 48.4, 103.6, to 272.4 minutes, respectively (graph 1). The pulse rate rose to averages ranging from 107.13 to 168.38, the temperature to 38.35 C. to 39.21 C., and the respiratory rate to 17.56 to 58.46.

Toxic and Lethal Doses.—In the trials with the toxic and lethal doses, the results during the induction stages were practically the same as for the therapeutic doses.

During the stage of surgical anesthesia, with toxic doses (41 to 46 mg./lb.), the pulse became weak and rapid, the respiration slow and shallow, indicating a near-respiratory arrest, and shivering was observed in all these dogs. Also, urination occurred in 3 dogs; defecation in 2; the visible mucosa became slightly cyanotic;

†Dicrysticin is produced by E. R. Squibb and Sons, New York, N.Y.

TABLE 1—The Duration of Surgical Anesthesia in 8 Dogs Given Various Doses of 10 Per Cent Kemithal Sodium Solution Intravenously Prior to Surgery

Doses given	0.2 cc./lb.		0.25 cc./lb.		0.33 cc./lb.		0.4 cc./lb.	
Dog No.	1	2	3	4	5	6	7	8
Age (months)	12	10	18	12	18	12	12	8
Sex	F	M	M	M	F	F	F	F
Weight (lb.)	15.84	22.44	26.62	35.44	24.64	15.62	20.24	15.18
No. of ml. given	3.1	4.4	6.6	8.3	8.2	5.2	8	6
Operations performed	Docking	Castration	Docking & castration	Ear-trimming & docking	Oophorectomy	Gastrotomy & splenectomy	Gastrotomy & splenectomy	Ovariohysterectomy
Duration of surgical anesthesia in minutes	16.00	18.00	30.00	43.00	70.00	87.00	112.00	117.00
Average duration	17.00		36.50		78.50		114.50	

and the pupils, which were contracted during surgical anesthesia, were dilated—a warning of practical importance. Compared with therapeutic doses the duration of the stage of surgical anesthesia with toxic doses averaged about 22 minutes longer, the pulse rates were higher (ave. 136 to 150) and the respiratory rates and temperatures averaged slightly lower.

During the stage of recovery from toxic doses, salivation was slight in 2 dogs and profuse in 3. There was slight struggling in 3 dogs, indicating excitement. In contrast to therapeutic doses, the respiration was irregular and the pulse was rapid and irregular. Defecation and urination occurred in all 5 dogs. The temperature was still subnormal when the reflexes returned, so shivering was marked in 3 dogs until the body temperature returned to normal. The duration of recovery was long, from 18 to 36 hours.

With the minimum lethal dose (46.9 mg.), 1 dog died 40 minutes after injection; bigger doses killed the other 4 dogs in a few minutes to a few seconds. Death was brought about by respiratory arrest, the heart continuing to beat feebly for a time.

Surgical Cases.—The operations performed (table 1) were docking, castration, ear-trimming, oophorectomy, gastrotomy, splenectomy, and ovariohysterectomy. All were successful and the wounds healed by first intention. Surgery did not alter greatly the duration of anesthesia.

All the experimental and surgical dogs, except those that received toxic doses, showed good appetites after recovery. The dogs which received toxic doses took little or no milk during the first day of recovery but aside from this there were no untoward effects.

In general, the results presented in this study are similar to the observations of Edds and Trace.[2]

SUMMARY

The anesthetic value on 38 native dogs of a nonvolatile, short-acting general anesthetic, kemithal sodium, given intravenously in 10 per cent solution, is reported

1) The period of induction was smooth rapid, and without excitement, ranging approximately from five to 12 seconds.

2) The average duration of surgical anesthesia varied from approximately 19 to 116 minutes with therapeutic doses of 0.2 to 0.4 ml. per pound of body weight. The signs observed were deep and slow respiration, excellently relaxed muscles, congestion of the visible mucous membranes, tachycardia, miosis, and occasional slight salivation.

3) The stage of recovery varied with the dosage, averaging approximately 36 to 272 minutes. The animals regained consciousness quietly and rapidly, and without a struggle.

4) Doses of 0.33 to 0.4 ml. per pound of body weight are indicated for operations that will last for one hour or more, while the dose of 0.2 ml. is useful in minor surgery.

5) Kemithal sodium in 10 per cent solution given intravenously as a general anesthetic has a wide range of safety.

6) Doses of 41 to 46 mg. per pound of body weight were found to be toxic.

7) The minimum lethal dose is 46.9 mg. per pound of body weight.

References

[1]Jones, L. M.: Veterinary Pharmacology and Therapeutics. 1st ed. Iowa State College Press, Ames, Iowa (1954): 168-169.

[2]Edds, G. T., and Trace, J. C.: A New General Anesthetic for Small Animals. Vet. Med., 49, (1954): 81-84.

Corpora Lutea and Slow-Breeding Cows

In New Zealand, when corpora lutea were expressed five to 14 days after estrus, in apparently normal cows which continued to return to service, 61.5 per cent conceived at the service which ensued in two to nine days, 30.2 per cent at the second, and 1.7 per cent at the third service; 93.4 per cent became pregnant in seven to eight weeks.—*Vet. Bull., June, 1955.*

Feeding Stilbestrol to Mink

Two groups of 10 female mink were fed a ration, 25 per cent of which was tripe; one group received unwashed tripe from steers which had been fed diethylstilbestrol as recommended. The feeding started 16 days before mating and continued for 93 days. Of the 10 controls, 8 had a total of 33 kits while 7 of the 10 principals had 31 kits, all normal. Further tests are planned. This tripe apparently was not injurious. —*Am. Fur Breeder, July, 1955.*

Maintaining Nephrectomized Dogs

Fifteen bilaterally nephrectomized dogs were maintained five to 111 days by feeding a low salt ration and maintaining hydration by peritoneal dialysis three times daily for a week, then twice daily. For dialysis, 1.5 to 2.0 liters of electrolyte solution was introduced intraperitoneally and drained after two hours. All of the dogs developed anemia and, after the first week, hypertension.—*Vet. Bull., June, 1955.*

Preparing the Gut for Surgery

In recent years, powerful antibacterial drugs have been commonly used prior to intestinal surgery to decrease the intestinal flora and the chances of postoperative infection. This has been accompanied by increasingly frequent reports of sudden severe and often fatal postoperative enterocolitis. In three recent cases where such deaths occurred on the third to tenth postoperative days, coagulase-positive staphylococci which were resistant to penicillin and streptomycin were isolated from the intestine after death. The deaths were considered as "the result of the antibiotic 'umbrella' used to cover the operation." Some believe that "the fashion of gut sterilization has gone too far." They prefer to use the effective, slowly absorbed sulfonamides, and consider more complete sterilization with antibiotics as not worth the risk.

Staphylococci are not always at fault but where they "fill the 'bacteriological vacuum' produced by over-efficient sterilization of the gut," the thriving strain was probably already drug-resistant. The staphylococci often will respond only to erythromycin but because of the acute fulminating character of the condition, it is often fatal. Vitamin deficiency may be partly responsible; therefore, it is recommended that vitamins be used liberally, antibiotics sparingly, and the chief reliance in preoperative preparation be placed on the poorly absorbed sulfonamide.—*Brit. M. J., May 28, 1955.*

Cesarean Hysterectomy

In a review of 22,832 deliveries of babies, 1,188 were by cesarean section and 84 by cesarean hysterectomy, which is gradually replacing the subtotal operation. With modern facilities and training, the entire uterus can be removed safely. There were no maternal deaths.—*J.Am.M.A., Aug. 6, 1955.*

Trichloroethylene for Analgesia

Because of its relatively quick action, safety, and effectiveness, trichloroethylene (trilene) has been recommended by the British Medical Research Council for use as an analgesic by midwives in childbirths (*J. Am. M. A.*, March 5, 1955). Others recommend it as the best available analgesic for procedures in a physician's office. It has also been considered for use in producing unconsciousness in animals at the moment of slaughter.

Feed Level and Reproduction in Gilts

A study, using 138 gilts in two years, showed the first estrus occurring at 170 to 323 days of age, an average of 214 days. The average age for gilts on full feed was 223 days; for those fed two-thirds as much, it was 208 days. Those on full feed continuously after 10 weeks of age averaged about 12 ova at their first estrus, nearly 14 ova at their second estrus. Those on limited feed throughout averaged about

10.5 ova their first estrus, about 11.2 the second.

Gilts on limited feed until their first estrus, then on full feed, produced an average of 10.0 ova at the first and 13.5 at the second estrus. Those on full feed until the first estrus, then on limited feed until the second, produced an average of about 12 ova the first and about 11 at the second estrus. There was no significant difference in the fertilization rate in these groups.—*J. Anim. Sci., May, 1955.*

Pentobarbital Sodium as an Anesthetic for Bears

ELLWOOD MARTYN, D.V.M.

Norwood, Manitoba

In March, 1955, Winnipeg's park board superintendent presented the following problem: The grizzly bear at the Assiniboine Park Zoo had given birth to cubs. For temporary safety, the mother and cubs were locked in the den, but for the future safety of the cubs, the male (Sergeant Minto) had to be moved to a nearby pit. Due to the construction of the pit, the use of a trap-door cage was unsafe and an anesthetic was the only alternative.

When consulted by wire, Dr. J. Y. Henderson* suggested the use of pentobarbital sodium in a dose of 50 gr. dissolved in milk or given intravenously if possible. The problem of restraint rendered the latter method too risky and the taste of the drug in milk was so bitter that the bear would not take it.

We then experimented with the less valuable 275-lb. black bear, giving it a 35-gr. capsule of pentobarbital sodium immersed in a scoop of ice cream. This dose had only a sedative effect so one hour later he was given an additional 15 gr. Thirty minutes after the second dose he showed unsteadiness and 20 minutes later he vomited. The following day, the black bear showed no ill effects from the pentobarbital sodium.

We now felt it was safe to try the drug on the more valuable grizzly, so 180 gr. was given to the 900-lb. animal in capsule form buried in ice cream. One hour later, he showed only an unsteady gait but subsequent attempts to feed him ice cream failed. He recovered from the sedative and for one week viewed ice cream with suspicion.

One week later, it was decided to increase the dose to 240 gr. and give it to the grizzly in his favorite drink, Coca Cola. The capsules were suspended in the drink and when he opened his mouth they were poured in. He swallowed all without hesitation. One hour later, "Minto" was unable to stand for any length of time and in another hour he vomited profusely. He was now unable to stand and offered little resistance as a 1-inch rope was dropped over him and secured around his thorax behind the front legs. Ether, given with the aid of a large cone fastened to the end of a long pole was used to complete the anesthesia.

A huge truck derrick raised him then and lowered him into the nearby pit. The following day "Minto" was his old self again.

This experience indicates that bears require more pentobarbital sodium for anesthesia than domestic animals do, but this may be due to the loss of part of the drug by vomiting.

From the Anderson Animal Hospital Ltd., Norwood, Man.

The author thanks Mr. T. R. Hodgson and his staff for their help and suggestions.

*Dr. Henderson is chief veterinarian for Ringling Brothers, Barnum and Bailey Circus.

Live Pigs in Peritoneal Cavity

When a parturient sow was found to have a torn uterus and a cesarotomy was performed, 6 pigs were removed from the peritoneal cavity. Although there was no umbilical attachment, 3 pigs were alive and survived when placed on another sow. The uterus was repaired, the operation completed, and the sow lived.—*Rocky Mountain Vet., May, 1955.*

Placental tissue, when applied to poorly healing wounds and ulcers in man, was found to stimulate healing.—*J.Am.M.A., July 16, 1955.*

Hemolytic Disease in Foal Prevented.—Where hemolytic disease in a foal is foreseen, it may be prevented by avoiding nursing of the dam for 36 hours, by substituting another mare's colostrum, by the administration of antibiotics, and by frequent hand-milking of the mare.—*Vet. Rec., June 25, 1955.*

Dystocia in a Native Bitch

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A primigravid native 4-year-old bitch weighing 32 lb. was presented at the veterinary hospital, College of Veterinary Medicine, University of the Philippines, Quezon City, on March 2, 1955. The bitch had started labor five days before. She had pulled 1 fetus with her teeth after it was half out of the vulva. Later, she stopped laboring (uterine inertia). She had been injured at an early age at the croup (sacral region) in a car accident but had recovered without any visible deformity.

When admitted, her pulse was 120; respiration, 32; temperature, 99.3 F., and her abdomen was distended. Digital exploration revealed a narrow pelvic cavity, the cause of the dystocia. She could hardly walk and had a continuous greenish discharge from the vulva. She was approaching a comatose condition.

The bitch was immediately prepared for surgery. Calcium gluconate, 10.0 ml. of a 10 per cent solution, was given intravenously, followed by 2.5 ml. of sodium pentobarbital. After making a midline incision

Fig. 1—A native bitch four days after an ovariohysterectomy necessitated by protracted dystocia.

about 5 inches long, 5 full-term dead fetuses with some postmortem changes were removed from the uterus. Another fetus was breathing slightly but artificial respiration failed to revive it. After the cesarotomy, because of the cyanotic condition of the uterus and the danger of subsequent dystocias, ovariohysterectomy was performed.

Penicillin, 400,000 units in 4 cc. of distilled water, was placed in the abdominal cavity, then the peritoneal and muscular wounds were closed with No. 00 chromic catgut suture, and the cutaneous wound with interrupted silk sutures. Sulfanilamide powder was dusted on the wound before application of the bandage. She was given 200 ml. of 5 per cent dextrose in normal saline solution that day (50 ml. intravenously and 150 ml. subcutaneously), and 1 ml. of 20 per cent camphorated oil intramuscularly. The next day her pulse was 88; respiration, 28; temperature, 97.5 F., and she remained in deep slumber. Supportive therapy was continued for five days, the bitch arising on the third day. She was completely recovered by the tenth day.

Her unexpected recovery was attributed to the careful operative and postoperative treatment although native bitches apparently are more resistant to shock or toxemia than many other breeds of dogs.

Dr. Arañez is in charge of the large animal and ambulatory clinics in the College of Veterinary Medicine, University of the Philippines, and is foreign corresponding secretary of the AVMA in the Philippines. Dr. Lapuz is a recent graduate from the same college.

Liver Fat Changes in Pregnant Ewes

The total fat in 44 pregnant ewes was studied at different levels of nutrition and during starvation. At 138 to 143 days of pregnancy, well-nourished ewes had the same amount of liver fat (8.8%) as nonpregnant animals. Starvation imposed at 138 days then increased the liver fat. However, when the plane of nutrition was reduced at 100 days from a high level to near starvation, the fat content of the liver rose to 26.7 per cent at 140 days. When ewes, on a low plane of nutrition since the one-hundredth day of pregnancy, were starved at 138 days, liver fat was slightly reduced. Pregnancy toxemia occurred in 3 unstarved ewes on a low plane ration.—*Brit. J. Nutr., 8, 269, in Vet. Bull., June, 1955.*

Rooster Discipline

A major problem in raising segregated young cockerels is the loss from fighting. A breeder, noticing that old cocks often stopped fighting among younger birds, now regularly places a few of the former with the young cockerels and has almost eliminated the loss from fighting.—*Agric. News Letter (du Pont), Sept., 1955.*

CLINICAL DATA

Leptospirosis in Wisconsin. I. Epizootiology and Clinical Features

E. V. MORSE, D.V.M., Ph.D.; VIRGINIA ALLEN, M.S.; A. F. KROHN, D.V.M.; R. HALL, D.V.M.

Madison, Wisconsin

THE LEPTOSPIROSES are zoonotic diseases caused by members of the genus, Leptospira (Noguchi). *Leptospira pomona* infections are economically important and appear to be of great consequence to all segments of the American livestock industry and, indirectly, to the general public.

Bovine leptospirosis was first reported in the United States by several workers during the past decade.[4-6] *Leptospira pomona* infection, according to Reinhard,[8] is now known to exist in "all geographic sections" of this country. The disease is prevalent in cattle and swine; it has been reported in horses,[2,9] and its presence is suspected in sheep.[1] *Leptospira pomona* infections in cattle were first recognized in Wisconsin by Spencer and Lillesand.[11] Absolute identification of the etiological agent was not accomplished since leptospiras were cultured neither from infected cattle nor from guinea pigs inoculated with materials from infected cattle.

This report (part I) deals with the prevalence and epizootiology of *L. pomona* infection in this state, and the nature or course of leptospirosis in cattle and swine.

From the Department of Veterinary Science, University of Wisconsin, Madison. Dr. Morse, who was assistant professor in the Department of Veterinary Science when this work was done, is now in the Department of Microbiology and Public Health, Michigan State University, East Lansing. Miss Allen is bacteriologist, State Laboratory of Hygiene, Medical School, University of Wisconsin; and Drs. Krohn and Hall are at the Wisconsin State Department of Agriculture, Division of Livestock Sanitation, Disease Control Laboratory, Madison.

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The authors acknowledge the cooperation of the following practicing veterinarians: Drs. Q. C. Metzig, A. C. Kelman, J. E. Lillesand, P. L. Thompson, and C. D. Lyle. The encouragement and counsel of W. D. Stovall, M.D., director, State Laboratory of Hygiene, is acknowledged.

MATERIALS AND METHODS

The microscopic agglutination-lysis test, employing living organisms as antigens, was routinely conducted using serum dilutions of 1:10, 1:100, 1:1,000, and 1:10,000. Tests were incubated overnight at room temperature, *ca.* 25 C. Rat, muskrat, and human serums were tested against the following Leptospira species used as antigens: *L. pomona, L. icterohaemorrhagiae AB, L. canicola, L. hebdomadis* (Akiyami C), *L. australis* A, *L. australis* B (pyrogenes), *L. autumnalis* AB, *L. grippotyphosa, L. ballum,* and *L. bataviae.*

Chang's fluid medium,[3] which contained 0.1 per cent hemoglobin (Difco), was used for the isolation of leptospiras and for the production of the various agglutination-lysis test antigens. Following inoculation with suspected material, tubes of medium were incubated at 27 to 30 C. Examinations by dark-field microscopy were made at weekly intervals for one month before final status of the cultures was determined.

Young guinea pigs weighing 200 to 250 Gm. (or for some of the work, weanling hamsters) were inoculated intraperitoneally with materials which were suspected to contain leptospiras. Rectal temperature readings were made daily following inoculation of the guinea pigs. Whenever an animal's rectal temperature reached or exceeded 104 F., blood was withdrawn by cardiac puncture using sterile techniques and was cultured in Chang's fluid medium.[3] At autopsy three to four weeks following inoculation, the serums of the guinea pigs and hamsters were examined for leptospiral agglutinins.

Twenty-four wild brown rats *(Rattus norvegicus)* were trapped alive in a lakeside, urban area of Madison. Another group, consisting of 15 brown rats, was trapped at the Madison city dump. A total of 12 mature males, 16 mature females, 6 young males, and 5 young females was brought to the laboratory and exsanguinated under ether anesthesia. Serums were collected for the agglutination-lysis test. Approximately 1 cc. of 10 per cent homogenized kidney suspension in sterile 0.85 per cent sodium chloride solution was prepared from each rat and inoculated into each of 3 guinea pigs and 3 weanling hamsters via the intraperitoneal route. Urine, when obtainable, was

inoculated into four or five tubes of Chang's medium.[2]

Blood serum samples from 11 muskrats from the Horicon Marsh area were tested against a number of leptospiral antigens. Isolations of leptospiras from the muskrats were not attempted.

Investigations were conducted on infected herds of cattle throughout the state. Proof of infection was based upon both serological and symptomological criteria. Historical and clinical data were obtained. The isolation of leptospiras from urine and aborted fetuses by animal inoculation procedures was attempted, together with determinations of the leptospiral serum and whey titers of a number of animals in the herds. The herds were retested at six- to 12-month intervals. Agglutination-lysis tests were also conducted on the serums from human beings, dogs, swine, and horses in contact with the infected animals.

RESULTS

Cultures of rat urine did not yield leptospiras. Neither the guinea pigs nor hamsters inoculated with kidney suspensions gave clinical or serological evidence of leptospirosis. Serum from 1 of the rats agglutinated *Leptospira hebdomadis* (Akiyami, C), *L. pomona*, and *Leptospira australis* A at the 1:100 dilution, while *Leptospira autumnalis* AB, was agglutinated at 1:1,000.

Fig. 1—Prevalence and distribution of leptospirosis by counties in Wisconsin from July, 1952, through February, 1955. Numerals encircled represent porcine outbreaks, while those not encircled represent the bovine outbreaks. Cattle population is greatest in the southern portion of the state.

Leptospiral agglutinins were not demonstrable in the blood serum of the muskrats.

Serums of 15 persons residing on seven separate *L. pomona*-infected farms and having daily contact with the infected cattle or their products proved to be negative for leptospiral agglutinins. The serums were obtained two to four months after evidence of infection was determined among the cattle.

The serum from a Shepherd-type dog, which was allowed to mingle with the cows, drink their milk, and had been known to eat aborted materials from infected cattle, was found to have an *L. pomona* titer of 1:1,000. This dog was exsanguinated and kidney tissue inoculated into guinea pigs and hamsters. The experimental animals remained clinically and serologically negative. A dog maintained under similar conditions on another farm had a serum titer of 1:100 for *L. pomona*. Neither animal gave evidence of illness, according to the owners.

On one farm where 2 draft horses were stabled with infected cattle, the serums of both animals agglutinated *L. pomona* at the 1:100 dilution. The serums of 5 hogs which mingled freely with infected cattle on a "creek bottom" type of pasture were found to be negative for *L. pomona* agglutinins.

Leptospiras were isolated in pure culture from guinea pigs' blood, following inoculation with the urine of some infected cattle. The cultures obtained represented individual cattle on four separate farms. Isolations were accomplished from the pooled, homogenized suspension of spleen and kidney of a newborn pig which was born in a weakened condition.

The antiserums prepared against the five Wisconsin isolates agglutinated known *L. pomona* antigens to the approximate extent of titer obtained with the homologous strains. The reciprocal tests showed similar reactions. These Wisconsin strains appear to be *L. pomona*. Agglutinin-absorption tests are being conducted.

Bovine and porcine leptospirosis is apparently widespread in Wisconsin. The disease is known to be present in 48 of 71 Wisconsin counties (fig. 1). From July, 1952, until March, 1955, 366 outbreaks involving at least 2,689 cattle were detected. During the same period, 24 outbreaks in swine were reported. Diagnosis was made

on the basis of both clinical and serological criteria.

Over a three-year period, beginning in 1952, the disease was most prevalent during the months of August and September. However, leptospirosis was detected clinically or serologically during each of the 12 months of 1954. During 1954, the greatest number of outbreaks was reported in November, but many were also reported in September, October, and December. It is felt that this was due, in part, to the establishment of a serological testing laboratory which was in a position to examine several hundred samples per week. During these months, a greater number of samples was submitted since testing facilities became readily available.

Histories of leptospirosis outbreaks provided by practicing veterinarians indicated that cattle on several farms along a creek or in its watershed had experienced the infection. It is apparent that contaminated water, as in the case of leptospirosis in man, may play an important part in the dissemination of *L. pomona* infection among cattle and swine.

Most reports concerning bovine leptospirosis in this state indicate that the disease is most prevalent clinically and of the greatest consequence in pregnant or lactating cattle. The mortality has been greatest in mature animals. The mortality for all age groups appeared to be below 1 per cent.

The majority of bovine abortions associated with leptospirosis occurred during the seventh month of pregnancy; however, abortions occurred as early as the fourth month or as late as the end of the eighth month. The highest seasonal incidence of the disease occurs at a time when many Wisconsin cattle are in the latter stages of gestation. This fact may account for the preponderance of near-term abortions. First-calf heifers often showed only abortions and serological reactions as evidence of leptospirosis. The abortion rate in most of the herds studied ranged from 20 to 50 per cent among pregnant cattle in a herd. However, in a few herds abortions were not reported. Bovine abortions were observed two to five weeks following the suspected exposure to *L. pomona*. It has been observed in a number of brucellosis-free, leptospirósis-infected herds that most of the cattle at the time of their abortion have a serological titer of 1:1,000 or higher. Since this titer would not be expected to occur much sooner than ten to 14 days after contact with and parenteral entry of the leptospiras, it would appear that abortion was not a manifestation of the acute phase of bovine leptospirosis. In addition, the cattle were asymptomatic at the time of abortion. Data obtained from pregnant cattle, experimentally infected with *L. pomona*, substantiates this premise.[7,10]

Retention of the fetal membranes following abortion was reported to have occurred in 1 or more cattle in approximately 20 per cent of the outbreaks. Animals from several herds were sold because of breeding difficulties. Several reports indicated that the membranes were extremely difficult to remove because of considerable edema and friability. Removal of the entire membrane was seldom possible. Residual portions which remained in the uterus inevitably resulted in some degree of metritis. Metritis was observed by several practitioners and probably led to subsequent sterility, either temporary or permanent.

The exact role of leptospirosis in the realm of breeding problems is difficult to assess. Some of the observed herds showed reduced fertility rates during the year following the outbreak.

During the acute phase of the infection, 15 to 25 per cent of the animals were observed to virtually cease lactating for two to five days. The lacteal secretion was thick, yellow, and contained flakes or blood. The udders of some animals were swollen, resembling those seen with acute bacterial mastitis. In some herds, udders were flaccid during the latter phases of infection. A gradual return to 20 to 75 per cent of their usual milk production was observed in most cows, and those near termination of the lactation period usually ceased lactating entirely. Agglutinins were detectable in the milk whey of infected cows. The milk production of infected herds decreased as much as 50 per cent. Over a period of several months, herd production levels gradually returned and were almost equal to those prior to the outbreak.

Hemoglobinuria was observed in 1 or more cows in approximately 50 per cent of the infected herds. Agglutinins were not detected in the urine of infected cattle.

Pyrexia occurred in 1 or more animals in 20 per cent of the herds which were studied

Body temperatures of 106 F. were reported in some animals. Apparently, fever was not a consistent sign of the disease, occurring only in cattle severely and acutely affected.

Icterus or anemia or both were observed in 1 or more cattle in approximately 5 per cent of the infected herds. These manifestations were not apparent or did not occur except in the most severe and fatal cases.

Anorexia and depression were reported in nearly all of the outbreaks. Diarrhea, labored breathing, stiffness of the legs, and loss of body weight were also reported. Emaciation has been most consistently observed in those herds which were poorly fed and managed.

A summary of the clinical observations for 41 infected herds appears in table 1.

TABLE 1—Herd Histories and Clinical Features of 41 Serologically Proved Outbreaks of Bovine Leptospirosis

	No. herds in which reported
Age of cattle affected	
1) Mature stock only	38
2) Mature stock and calves	3
Mortality among cattle	
1) Mature stock only	4
2) Mature stock and calves	1
Species affected	
1) Cattle only	40
2) Cattle and swine	1
Symptoms and signs recorded	
Abortions	36
Retained fetal membranes	9
Decreased lactation	30
Abnormal milk:	
1) Thick or yellow	28
2) Bloody	9
Hemoglobinuria	22
Anorexia	25
Depression	12
Pyrexia	8
Anemia	3
Icterus	2
Loss of body weight	8
Diarrhea	3
Dyspnea	1
Joint stiffness	1

Limited observations pertaining to porcine leptospirosis in Wisconsin indicate that abortions and birth of weak pigs are the most obvious, and sometimes the only, evidences of *L. pomona* infection. Metritis and lowered fertility have been frequently encountered. In one drove, 37 of 40 pregnant sows aborted or gave birth to moribund litters. Encephalitis, hyperirritability, incoordination, and body temperatures of 103 to 105 F. were reported to have occurred in 9 swine in a drove of 93. The distribution of porcine leptospirosis in Wisconsin for the period of July, 1952, through February, 1955, is shown in figure 1.

SUMMARY

The serum of 1 of 39 wild brown rats agglutinated the following antigens at the 1:100 or 1:1,000 serum dilution level: *Leptospira pomona*, *Leptospira hebdomadis* (Akiyami C), *Leptospira autumnalis* AB, and *Leptospira australis* A. Leptospiras were not isolated from the kidneys of the 39 rats. Serums obtained from 10 muskrats did not contain agglutinins for any of ten leptospiral serotypes.

The serums of 15 persons who were in contact with *L. pomona*-infected cattle for several months did not give evidence of agglutinins. Two horses and 2 dogs, in contact for several months with infected cattle, developed serum titers for *L. pomona*. Attempts to isolate leptospiras from the kidney tissue of 1 dog at the time of necropsy were unsuccessful.

Leptospiras were isolated from guinea pigs inoculated with the urine of individual cattle involved in four outbreaks of leptospirosis and from the spleen and kidney of a moribund newborn pig. The five strains isolated appeared to be *L. pomona*.

The geographical distribution, mortality, and morbidity of leptospiral infections among farm animals in Wisconsin are discussed.

Clinical findings observed in 41 herds of infected cattle are recorded. Abortions, usually during the seventh month of gestation, decreased milk production, abnormal lacteal secretion, hemoglobinuria, anorexia, and general depression represented the most commonly reported manifestations.

References

[1]Beamer, P. D., Hardenbrook, H., Jr., and Morrill, C. C.: Studies on Leptospirosis in Domestic Animals. I. Leptospirosis in Sheep. Vet. Med., *48*, (1953): 365-366.

[2]Chang, S. L.: Studies on *Leptospira Icterohemorrhagiae*. J. Infect. Dis., *81*, (1947): 28-34.

[3]Hall, C. E., and Bryans, J. T.: A Case of Leptospirosis in a Horse. Cornell Vet., *44*, (1954): 345-348.

[4]Jungherr, E.: Bovine Leptospirosis. J.A.V.M.A., *105*, (1944): 276-281.

[5]Marsh, H.: Leptospira in Bovine Icterohemoglobinuria. J.A.V.M.A., *107*, (1945): 119-121.

[6]Matthews, F. P.: A Contagious Disease of Cattle

Associated with Leptospira. Am. J. Vet. Res., 7, (1946): 78-93.

[7]Morse, E. V., and McNutt, S. H.: Unpublished data, 1954.

[8]Reinhard, K. R.: Newer Knowledge of Leptospirosis in the United States. J. Exptl. Parasitol., 2, (1953): 87-115.

[9]Roberts, S. J., York, C. J., and Robinson, J. W.: An Outbreak of Leptospirosis in Horses on a Small Farm. J.A.V.M.A., 121, (1952): 237-242.

[10]Ringen, L. M., Bracken, F. K., Kenzy, S. G., and Gillespie, R. W. H.: Studies on Bovine Leptospirosis. I. Some Effects of Dihydrostreptomycin and Terramycin on the Carrier Condition in Bovine Leptospirosis. J.A.V.M.A., 126, (1955): 272-276.

[11]Spencer, G. R., and Lillesand, J. E.: An Acute Disease Probably Associated with Leptospira. Wisconsin Vet. Sci. News, 4, (1950): 14-15.

The Effect of Influenza on Young Pigs

From 50 to 70 per cent of the swine lungs observed at midwestern abattoirs show lesions, many of which are similar to those of swine influenza. A study to evaluate the prevalence of swine respiratory diseases was conducted from 1949 to 1953, primarily by serology. The study, which included over 2,000 swine serums, indicates that there is an immunological similarity between the Shope 15 virus of swine influenza and two human type A influenza viruses.

Serological evidence of infection, usually the Shope 15 type, was found in 24 per cent of the sows studied in 1949 to 1950, but for the four years the average was only 10 per cent. Evidence of the human type of virus infection in these animals was rare.

Methods used in the preparation of human influenza vaccines were followed in producing a polyvalent formolized vaccine from five strains of swine and human influenza viruses. Sows used for spring farrowing were vaccinated two to four weeks before being bred, half of the sow herd being used as controls. Some sows were given a second injection before breeding and others a third injection midway in gestation.

This vaccination was undertaken in an attempt to reduce the usual 25 to 30 per cent mortality among suckling pigs by the stimulation of antibodies, against this infection, which the sow would pass to her pigs through the colostrum. Sows in one herd with an average pig mortality for ten years of 26.3 per cent were, in the fall of 1949, twice vaccinated at a two-week interval just before breeding. Both the vaccinated and unvaccinated sows farrowed an average of about 8.4 pigs per litter. The 31 vaccinated sows weaned an average of 6.1 pigs with an average weight of 30 lb., while the 32 control sows weaned an average of about 5 pigs with an average weight of about 28 lb.

However, when the sows in ten herds were similarly vaccinated the following year, there was no significant difference in the livability and weight of their litters and those of the controls. The serum titers of the vaccinated dams indicated protection against the influenza virus and antibodies were presumably transferred to their pigs, but it is possible that influenza virus was not an important factor in the pig mortalities in that particular season.

With the maximal incidence of influenza less than 15 per cent in the swine studied, the balance of the 50 to 70 per cent with lungs which showed evidence of respiratory disease would seem to have been affected by other respiratory infections.

In recent years a disease, or diseases, which produces gross pathological changes indistinguishable from those of the influenza virus, has been reported from various countries. The disease, called "virus pneumonia of pigs," may also be present in the United States. This possibility should be investigated.

Furthermore, it has been demonstrated that pig losses can be limited to less than 10 per cent by avoiding infection, even though the pigs are obtained by hysterectomy and raised in isolation on cow's milk, without benefit of colostrum. Therefore, it would seem possible to reduce the usual high mortality in suckling pigs if the disease-causing factors were identified and proper control programs established.—*George A. Young and Norman R. Underdahl: An Evaluation of Influenza in Midwestern Swine. Am. J. Vet. Res., 16 (Oct., 1955): 545.*

Hemorrhagic Syndromes in Chickens.—When the pathology and hematology of 31 field cases of hemorrhagic disease in young chickens was compared with that of the hemorrhagic condition produced in the laboratory by vitamin K deficiency, the two syndromes were definitely distinct and dissimilar. The cause of the hemorrhagic disease remains obscure.—*Cornell Vet., July, 1955.*

Leptospirosis in Wisconsin. II. Serological Studies

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THE PERSISTENCE and extent of *Leptospira pomona* serum agglutinins in domestic animals is of paramount diagnostic importance. Reinhard[7] states that in cattle "serum antibody titers of 1:10,000 to 1:100,000 are usually attained rapidly and maintained for one to three months." The serological examination of 24 animals which reacted at the 1:10,000 to 1:100,000 level in September, 1951, disclosed that by December, 1952, all titers were 1:10 to 1:1,000.[7] However, in a large dairy herd, Reinhard[7] found that the number of 1:100 and 1:10,000 titers gave little evidence of decreasing during the succeeding nine months. Erdheim[2] observed a cow which retained a "positive titer" for 26 months. Howarth[4] comments that antibody titers appear rapidly, often within seven to ten days after the start of the infection, and that agglutinin levels are maintained for several months thereafter. Leptospiral antibody levels of 1:10,000 are commonly observed among cattle in most of the epizootics. The persistence of serum titers and stability pose a serious problem in the serodiagnosis of bovine leptospirosis.

Apparently *L. pomona* agglutinins in the urine of infected cattle have not been observed or, if so, their presence remains unreported. However, milk whey agglutinins are detectable in the milk of cattle which have serum antibody titers. Van der Hoeden[10] has reported the presence of milk whey titers in cattle and goats infected with *Leptospira grippotyphosa* and *Leptospira canicola* in Israel.

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This report is a continuation of previous investigations[6] and is concerned with the persistence of titers in the serum obtained from (1) infected herds, (2) individual animals within the herd, and (3) cattle which were known to be acutely ill. The report also attempts to correlate the serum and milk whey titers of infected cattle.

MATERIALS AND METHODS

Chang's fluid medium,[1] which contained 0.1 per cent hemoglobin (Difco), was used for the propagation of leptospiras which were employed as antigens for the agglutination-lysis test. The test was conducted in 100- by 13-mm. glass tubes with 0.2 ml. as the final volume. Tenfold dilutions were made of the serum, employing 0.85 per cent sodium chloride solution as the diluent. An equal volume of the living *L. pomona* antigen (strain Johnson) was added and the microscopic test was read after overnight incubation at room temperature.

Those serums which showed contamination by this method were re-examined as follows: 0.1 per cent formalin was added to the buffer in which the serum dilutions were made, and live antigen was again added. The formalin suppressed the contamination, killed the leptospiras, and agglutination without lysis occurred. Milk whey was obtained following the action of rennin on the skimmed milk samples held at 4 C. for 18 hours. The agglutination-lysis test was then conducted as previously described using the whey. Serum and whey dilutions of 1:10, 1:100, 1:1,000, and 1:10,000 were made for all samples. The highest dilution which gave any evidence of agglutination, or lysis, or both was recorded as the titer for the sample.

RESULTS

The initial serological tests for leptospirosis, conducted one to three months after the onset of *L. pomona* outbreaks, disclosed that 25 to 100 per cent of the cows had titers. The majority of serum antibody titers for individual cows were at the 1:1,000 or 1:10,000 level. Subsequent retesting of infected herds indicated that high titers were persisting during the course of several months and for as long as 29 months.

When one herd[9] was examined 56 months after the recognized onset of leptospirosis, 3 of the cows were still found to have titers. The results of serological examina-

tions of 18 infected herds are given (table 1).

Serological examinations at three to 26 months following the initial tests of cows in 12 infected herds indicated that approximately 70 per cent of the 1:10 to 1:100 titers tended to recede, while about 15 per cent were unchanged and approximately 15 per cent reached 1:1,000 or higher. Approximately 45 per cent of the 1:1,000 titers receded, 22 per cent remained at 1:1,000 and 33 per cent attained the 1:10,000 level. Approximately 82 per cent of the 1:10,000 titers remained at that level while 18 per cent receded. The percentages are based on the total animals giving the respective titers in this survey (table 2).

Leptospiral serum titers persisted for approximately 56 months in a cow in which clinical manifestations of leptospirosis had been observed.[9] The majority of the cattle in all herds observed initially had titers of 1:10,000, and there was a definite tendency for retention of some titer for at least 29 months. A titer of 1:10,000 was observed in 1 animal two weeks prior to abortion and in 7 cows at one to seven days subsequent to abortion. The results of the persistence of seum antibody levels in animals which had shown clinical evidence of leptospirosis are presented in table 3.

Whey agglutinins were demonstrable for a number of cows for as long as 29 months after the onset of leptospirosis in the herd. The serum antibody titer of these animals was 1:1,000 to 1:10,000. Whey reactions were not observed for any animals which had serological titers of 1:10 or 1:100.

Both serum and whey agglutinins were demonstrable for 13 of 14 cows in a herd where leptospirosis had been present for approximately two months. Six of the whey titers were 1:1,000, five were 1:100, and two were 1:10. The animals had been lactating for periods of two to eight months. Whey titers were not as readily demonstrable for cattle in the later stages of lactation in herds in which the infection was known to have occurred 15 to 29 months previously. In general, the highest whey titers were found among cows which had been lactating for one month or less. After four months of lactation, the whey titers

TABLE 1—Persistence of Leptospira Pomona Serum Agglutinin-Lysin Titers in 18 Infected Herds of Cattle

Herd	Approx. onset	Serum obtained at	No. of samples with reciprocal titers of				
			0*	10	100	1,000	10,000
McMillan	Aug. 1953	1 mo.	0	0	1	5	16
		5 mo.	15	3	2	4	22
Allen**	Aug. 1953	2 mo.	12	2	0	1	3
		16 mo.	34	0	0	0	1
Schuster**	Sept. 1953	0 mo.	9	0	2	1	15
		15 mo.	25	0	1	5	8
Mackie	Aug. 1953	2 mo.	10	2	1	2	7
		4 mo.	22	0	1	0	3
Blackburn‡	Aug. 1953	2 mo.	10	1	4	6	16
Benson	Sept. 1953	1 mo.	5	2	0	0	8
Hanson	Sept. 1953	1 mo.	7	2	1	3	15
		10 mo.	1	5	2	4	11
Wickard**	Oct. 1953	1 mo.	4	0	0	2	24
Lakewood†	July 1953	6 mo.	104	4	8	11	20
		8 mo.	52	12	25	10	14
		14 mo.	110	18	16	9	15
Cole-Ripp‡	Sept. 1954	1 mo.	6	0	0	1	34
		5 mo.	0	0	2	1	32
Waefler**	July 1953	3 mo.	5	2	0	2	22
		10 mo.	11	0	1	7	18
Hansen, W.	Summer 1952	8 mo.	5	5	6	4	1
Kempfer	Fall 1953	4 mo.	12	2	5	4	11
Sheele	July 1952	3 mo.	0	0	1	0	21
		29 mo.	2	0	5	8	10
Chadwick	Sept. 1952	1 mo.	1	0	3	4	6
		27 mo.	11	1	1	6	4
Kroneman	Sept. 1952	1 mo.	3	4	0	3	8
		27 mo.	18	2	1	4	6
Tschanz§	Aug. 1949	56 mo.	21	0	2	1	0
Kahl, R.	Sept. 1952	3 mo.	0	0	1	1	2
		9 mo.	11	1	4	5	11
		20 mo.	10	1	8	10	18

0* = No evidence of serum agglutinins at the 1:10 dilution level; **L. pomona isolated from cow urine in this herd; †beef herd, other herds dairy type; ‡herd positive for brucellosis (unless identified, the herds are negative); §brucellosis status unknown.

were usually absent and, if present, were not higher than 1:10.

That serum agglutinins persisted in a greater proportion of animals than did whey agglutinins is indicated in this survey (table 4).

DISCUSSION

Serological diagnosis based on the agglutination-lysis test alone is unreliable in a herd. Since *L. pomona* titers may persist at 1:1,000 or 1:10,000 in some cattle for over two years, the results of one test of either a single animal or a group of animals is worthless insofar as determining the current leptospirosis status is concerned. Retesting any number of cattle at two- to four-week intervals, in the hope of detecting the characteristic ascending titer of the recently infected animal, is usually impractical. Few veterinarians have the time to devote to such a procedure and few, if any, governmental diagnostic laboratories are prepared to handle routinely a great volume of agglutination-lysis tests. Therefore, the practical approach would be to use serological results obtained from a few animals together with the presence of the clinical features suggestive of acute leptospirosis as diagnostic criteria. Practicing veterinarians should always submit a complete herd history with the blood samples which are sent to the laboratory for diagnosis.

Milk whey agglutinins, as well as serum antibody levels, have shown a tendency to

TABLE 2—Persistence of Leptospira Pomona Serum Agglutinin-Lysin Titers of Individual Cows Over a Period of Months

Herd	First sampling		Second sampling	Titer distribution				
	Titer	Samples (No.)	Months	0*	10	100	1,000	10,000
McMillan	1:100	1	—	1	—	—	—	—
	1:1,000	3	5	1	—	1	—	1
	1:10,000	12	—	—	1	1	1	9
Allen**	0*	1	—	—	—	—	1	—
	1:10,000	1	14	—	—	—	—	1
Schuster**	1:100	1	—	1	—	—	—	—
	1:10,000	4	15	—	—	—	1	3
Mackie	1:10	2	—	2	—	—	—	—
	1:100	1	14	1	—	—	—	—
	1:10,000	3	—	1	—	—	—	2
Hanson	0	3	—	—	1	—	—	2
	1:100	1	9	—	—	1	—	—
	1:10,000	9	—	1	—	—	2	6
Cole-Ripp‡	0	8	—	—	—	1	—	7
	1:1,000	3	14	—	—	1	—	2
	1:10,000	21	—	—	—	—	1	20
Waetler**	1:10	1	—	—	—	—	—	1
	1:1,000	2	7	—	—	—	1	1
	1:10,000	9	—	—	—	1	—	8
Sheele	1:1,000	2	—	—	—	—	2	—
	1:10,000	3	26	—	—	—	—	3
Chadwick	1:100	2	—	1	—	—	1	—
	1:10,000	2	26	—	—	—	1	1
Kroneman	0	1	—	1	—	—	—	—
	1:10	5	26	3	2	—	—	—
	1:1,000	2	—	—	—	—	1	1
	1:10,000	1	—	—	—	—	—	1
Kahl	0	1	—	—	1	—	—	—
	1:100	2	11	—	—	—	2	—
	1:1,000	2	—	1	—	—	—	1
	1:10,000	5	—	—	—	—	3	2
Lakewood†	0	22	—	—	8	11	3	—
	1:10	3	—	—	1	2	—	—
	1:100	6	3	1	1	2	2	—
	1,1,000	3	—	—	—	—	2	1
	1:10,000	4	—	—	—	1	—	3
Third test	0	2	—	2	—	—	—	—
	1:10	9	—	8	—	—	1	—
	1:100	19	6	16	2	—	1	—
	1:1,000	10	(following	2	1	4	1	2
	1:10,000	5	3rd test)	—	—	—	—	5

0* = Absence of agglutination or lysis or both at 1:10 serum dilution; **L. pomona isolated from cow urine in this herd; †beef herd, all other herds dairy type; ‡herd positive for brucellosis (unless identified the herds are negative).

TABLE 3—Level of Leptospira Pomona Serum Titers of Individual Cows During Periods Following Clinical Manifestations of Leptospirosis

Clinical manifestation	Time of sampling	No. of cows	No. of cows with titer of				
			0	1:10	1:100	1:1,000	1:10,000
Abortion	2 weeks prior to abortion	1	—	—	—	—	1
Hemoglobinuria	current	2	—	—	1	—	1
Abortion	1 day later	4	—	—	—	1	3
Abortion	3-7 days later	3	—	—	—	—	3
Abortion	2-3 weeks later	10	—	—	—	—	10
Abortion	1 month later	16	—	—	—	—	16
Acute signs only	1 month later	2	—	—	—	—	2
Abortion and acute signs	1 month later	3	—	—	—	—	3
Abortion	2-6 months later	6	—	—	—	1	5
Acute signs only	2-6 months later	1	—	—	—	—	1
Abortion and acute sign	2-6 months later	6	—	—	—	—	6
Abortion	7-12 months later	1	—	—	1	—	—
Abortion and acute signs	7-12 months later	7	1	—	1	—	5
Abortion and acute signs	15 months later	2	—	—	—	—	2
Abortion	29 months later	5	—	—	—	1	4
Abnormal milk	29 months later	1	1	—	—	—	—
Abnormal milk	56 months later	1	—	—	—	1	—

persist for many months following infection, particularly in cattle which have recently freshened. However, considerable variation in their persistence was observed among individual cows. Limited observations give some indication that more numerous and higher whey titers may be expected to occur in recently infected herds than in herds in which infection had occurred several months previously. Further investigations will be necessary before definite conclusions can be drawn on the true significance of milk whey titers.

York[11] has concluded that in cattle "abortion usually takes place ten to 16 days following initial infection." In another report, it is stated that abortions usually occur "three weeks after the end of the febrile period." Ringen *et al.*[5] have observed a bovine abortion due to experimental *L. pomona* infection which occurred 22 days after the onset of pyrexia. Agglutination-lysis test results indicate that abortions are not an acute manifestation of bovine letospirosis.[5] One cow was observed with a *L. pomona* agglutinin titer

TABLE 4—Leptospira Pomona Agglutinin-Lysin Levels in Serum and Milk Whey* of Individual Cows in Seven Herds

Time of sampling	No. of cows	Serum titers	Stage of lactation	No. of cows with titers of				
				0**	1:10	1:100	1:1,000	1:10,000
Two months after outbreak onset	14	1:10,000	1 month	1	—	4	4	—
			2 months	—	—	1	1	—
			6-8 months	—	2	—	1	—
15 to 16 months after outbreak onset	2	1:100	1 month	1	—	—	—	—
			8 months	1	—	—	—	—
	1	1:1,000	1 month	—	—	1	—	—
	11	1:10,000	4 days	—	—	—	—	1
			1 month	—	—	1	—	—
			2 months	1	1	—	—	—
			3 months	1	—	1	1	—
			4 months	1	—	—	—	—
			5 months	—	1	—	—	—
			6-8 months	2	—	—	—	—
27 to 29 months after outbreak onset	3	1:10	2-5 months	3	—	—	—	—
	6	1:100	1-3 months	6	—	—	—	—
	13	1:1,000	1 month	—	—	2	—	—
			1-3 months	8	2	—	—	—
			8 months	1	—	—	—	—
	20	1:10,000	1 month	1	2	1	1	—
			1 month	1	2	2	—	—
			2-3 months	2	7	—	—	—
			8 months	1	—	—	—	—

*Whey titers were not observed for cows which did not have serum titers; 0** = no evidence of agglutination at the 1:10 whey dilution level.

of 1:10,000 two weeks prior to abortion, and several cows had the same titer one to seven days following abortion. Generally, with the appearance of serum agglutinins, the more severe and acute symptoms of the disease are alleviated. Serum antibodies seldom appear earlier than two weeks after the parenteral entry of the parasite, and it would appear that abortions occur two to four weeks later. At this time, the cattle are observed to be asymptomatic[5,8] and appear to be recovering from the disease. Therefore, abortions probably should be considered as an aftermath, not a concurrent expression, of acute bovine leptospirosis.

Too often, laboratory serodiagnosis of leptospirosis is made after a number of cattle in the herd have aborted. It would seem that the veterinarian and herd owner, therefore, would not receive a laboratory diagnosis of bovine leptospirosis until two to four weeks after the onset of infection. The disease is generally explosive in its onset and exposure of the entire herd rapidly ensues. Any biological products which may engender an active immunity would require at least an additional two weeks to produce a suitable degree of protection. By then, four to six weeks will have elapsed since the onset of leptospirosis within the herd and the infection will probably have claimed most of its victims. These circumstances have precluded our recommending the use of vaccines in outbreaks in Wisconsin and it appears that they have not been employed in more than a limited way.

SUMMARY

Agglutination-lysis titers for *Leptospira pomona* were detected in the blood of cattle 56 months after the onset of leptospirosis.

The diagnosis of acute leptospirosis could not be made on the basis of serological evidence alone because a considerable number of cattle retained serum titers of 1:100 to 1:10,000 for 29 months following infection.

Clinical manifestations of acute leptospirosis, in addition to a single positive serological test, were necessary to substantiate a diagnosis of active infection.

Antibodies for *L. pomona* were demonstrable in the milk whey for most cows which had concurrent serum titers of 1:1,000 to 1:10,000, but not for cows which had lower serum reactions, *i.e.*, 1:10 to 1:100.

The highest whey reactions were usually observed for cows which had recently experienced infection.

The advisability and advantages of vaccinating cattle in known *L. pomona*-infected herds is questioned and discussed.

References

[1]Chang, S. L.: Studies on *Leptospira Icterohemorrhagiae*. J. Infect. Dis., *81*, (1947): 28-34.

[2]Erdheim, M.: Leptospirosis in Cattle. Some Selected Herd Histories. North Am. Vet., *34*, (1953): 22-24.

[3]Editorial: Bovine Leptospirosis Can Now Be Controlled. Allied Vet., *24*, (1953): 7-8.

[4]Howarth, J. A.: Leptospirosis. Lederle Vet. Bull., *13*, (1954): 30-31.

[5]Morse, E. V., and McNutt, S. H.: The Course of Leptospirosis in Pregnant Heifers. To be published.

[6]Morse, E. V., Allen, V., Krohn, A., and Hall, R.: Leptospirosis in Wisconsin. I. Epizootiology and Clinical Features. J.A.V.M.A., *127*, (1955): 417-421.

[7]Reinhard, K. R.: Bovine Leptospirosis. Symposium on the Leptospiroses. Med. Sci. Pub. No. 1, Army Med. Serv. Grad. School (Dec. 11-12, 1952): 126-139.

[8]Ringen, L. M., Bracken, F. K., Kenzy, S. G., and Gillespie, R. W. H.: Studies on Bovine Leptospirosis. I. Some Effects of Dihydrostreptomycin and Terramycin on the Carrier Condition in Bovine Leptospirosis. J.A.V.M.A., *126*, (1955): 272-276.

[9]Spencer, G. R., and Lillesand, J.: An Acute Disease Probably Associated with Leptospira. Wisconsin Vet. Sci. News, *4*, (1950): 14-15.

[10]Van der Hoeden, J.: A Milk Agglutination Test in Leptospirosis. Cornell Vet., *45*, (1955): 190-192.

[11]York, C. J.: Bovine Leptospirosis. Fort Dodge Biochem. Rev., *22*, (1952): 3-4, 26.

Resistance to Coccidiosis Inherited

Two strains of fowl were developed with marked difference in their resistance to artificial infection with *Eimeria tenella*. Resistance appeared to be influenced by a mendelian factor and not by transference of passive immunity through the egg.—*Vet. Bull., July, 1955.*

Salmonellosis from Easter Chicks.—In May, 1954, during an endemic of gastroenteritis, *Salmonella typhimurium* was isolated from the feces of 12 patients for whom the probable source of infection was chicks distributed as a publicity measure by stores before Easter. All of the chicks came from one hatchery.—*J.Am.M.A., July 30, 1955.*

Atrophic Rhinitis. V. An Effort to Obtain Atrophic Rhinitis-Free Pigs by Selection and Isolation

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THE DISCOVERY OF atrophic rhinitis in the swine breeding herd of the Agricultural Research Center, Beltsville, Md., in the spring of 1952, presented the problem of finding a method of acquiring and maintaing seven inbred lines free of this disease. The problem was approached (1) by selection, with the rhinoscope[1] at weaning time, of atrophic rhinitis-negative litters which were farrowed by sows having the most favorable history in relation to the disease; and (2) by removing pigs in an aseptic manner from the sow at birth and hand-raising them in isolation. This report covers only the first approach to the problem.

It was originally intended that only inbred sows with histories of having come from a rhinitis-negative litter would be used as a source of pigs for the initial selection. This, however, was found to be impossible. Therefore, in the spring of 1953, 14 of 38 inbred sows were tentatively selected on the basis of (*a*) having had litters in which a majority of the pigs were found to be negative, or (*b*) coming from a litter in which the majority of the litter mates were found to be negative for atrophic rhinitis. Two of these sows were found to have already farrowed and been moved to pasture lots, so they were returned to an area of segregation. When the litters of the 14 selected sows were 56 days old and examined rhinoscopically, 9 litters were found to be negative. Since 1 or more pigs in each of the remaining 5 litters showed positive indications of atrophic rhinitis, these litters were discarded. Two or more pigs from each of the negative litters were then placed in alternate pens in an isolation barn. Inasmuch as there was room in the barn for representatives of three more selected litters, crossbred and purebred sows were considered. Three sows, 2 crossbreds and 1 purebred, were selected on the same basis as the inbred sows. Although they had already farrowed and were in pasture lots, they were not brought in for examination until their pigs were 56 days old. These three litters were found negative and were placed in the remaining alternate pens in the isolation barn. A total of 59 weanling pigs, rhinoscopically negative for atrophic rhinitis, were thus obtained from 12 litters. These pigs were re-examined as a group in September, 1953, when the litters ranged from 4 to 7 months of age.

The status of the dams was also determined rhinoscopically at weaning time, with 11 found to be negative and 1 inbred sow diagnosed as positive for rhinitis. The litter of this positive sow was negative at weaning time, so it was among those selected.

Although the isolation unit was never intended for use as a farrowing barn, 10 gilts and 4 boars were retained for breeding in an effort to follow through with observations on a second generation of pigs during 1954. Selection of these animals, however, was made primarily on the basis of type and conformation by a member of the Animal and Poultry Husbandry Research Branch. When possible, gilts with a negative status to atrophic rhinitis were chosen. Of those selected, 8 were diagnosed as negative, with 1 positive, and 1 questionable. This program also required the introduction of 2 rhinitis-negative boars from the swine breeding herd and 1 from the hand-raised "atrophic rhinitis-free" herd. Six litters totaling 38 pigs were eventually raised to semimaturity to complete the observations on this second generation phase of the experiment.

Postmortem examinations for atrophic rhinitis were made on first and second generation animals that died or were killed and on those that became available after experimental use elsewhere.

The inside pens of the isolation barn were separated by solid metal partitions

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TABLE 1—History and Individual Status to Atrophic Rhinitis of the First Generation of Pigs

Dam	Status	Pigs (No.)	Postmortem exam.	Age (days)	Rhinoscopic examination	Age (days)	Postmortem examination	Age (days)
5475	(−)R	2	1(−)	108	1(−)	207	1(?)	356
1729	(−)R	4	0	.....	4(−)	207	1(−),1(+),1(?)	272
6199	(−)R	6	1(−)	113	5(−)	194	2(−)	261, 475
3242-S	(−)R	5	1(−),1*	77	5(−)	190	1(?)	463
1215	(−)R	6	1(−),1*	80	4(−)	183	.....	.....
1646	(−)R	6	.....	.....	4(−),2(?)	124	2(−),1(+)	133, 447, 189
3714	(−)R	5	.....	.....	3(−),1(+),1(?)	175	2(−)	239, 449
5056	(−)R	4	.....	.....	4(−)	160	3(−)	218, 319
5577	(+)R	3	.....	.....	1(+),2(?)	159	1(+)	390
5788	(−)R	8	.....	.....	8(−)	153	3(−)	211
5786	(−)R	5	.....	.....	1(−),2(+)2(?)	151	1(−),2(+)	201
4146	(−)R	5	.....	.....	4(−),1(?)	148	2(−),1(+)	198, 305, 428
Totals		59	4(−),2*	.....	41(−),4(+),8(?)	.....	16(−),6(+),3(?)	.....

R = rhinoscopic diagnosis; (−) = negative; (+) = positive; (?) = questionable; *not examined.

and the corresponding outside runs were separated by chain-link fences. Therefore, litters were segregated in alternate pens to provide maximum isolation under existing conditions.

Before this isolation barn was used, the inside was thoroughly cleaned and washed with 2 per cent lye solution. After 2 or more inches of sod had been removed from the outside runs, the exposed underlying coarse gravel was given a heavy spraying with 2 per cent lye solution and a good soaking with water. The residual lye, no doubt still present, did no apparent harm to the pigs. Lye buckets and brushes for boot scrubbing were provided at the entrance of the barn and of each pen containing pigs. Feed was delivered from the granary in sacks that had been cleaned by negative air pressure followed by steam pressure sterilization.

RESULTS

First Generation.—Six of the 59 selected pigs died or were killed before reaching semimaturity with 4 of them presenting normal turbinate structures. Although a postmortem diagnosis was overlooked on 2 of the 6 pigs, they probably were normal since each had a litter mate among the 4 preceding pigs mentioned. Of the remaining 53 pigs examined rhinoscopically when between 4 and 7 months of age, 41 were diagnosed as negative, 4 were positive, and 8 were classified as questionable. A postmortem examination was obtained on 25 of these animals in addition to the 4 positive pigs which were not considered because they were held in areas of known exposure to the disease for over four months after removal from the isolation barn. Of the 25, 16 had normal turbinates, 6 had definite lesions of atrophic rhinitis, and 3 were classified as questionable (table 1). The pigs called positive on rhinoscopic and postmortem examination, however, did not show external evidence of being affected with the disease.

Second Generation.—Five of the 38 pigs died or were killed before reaching semimaturity. Of the 5, 3 were negative, 1 was positive, and 1 was not examined. The remaining 33 were examined rhinoscopically at semimaturity with 31 being negative and 2 questionable. A postmortem examination was made on 11 of these pigs, 8 being negative and 3 questionable. Of the

TABLE 2—History and Individual Status to Atrophic Rhinitis of the Second Generation of Pigs

Sire	Status	Dam	Status	Pigs (No.)	Postmortem examination	Age (days)	Rhinoscopic examination	Age (days)	Postmortem examination	Age (days)
7694	(?)PM	7627	(−)PM	5	1(−)	107	1(?),3(−)	149	2(−),1(?)	107, 213, 156
7694	(?)PM	8463	(−)PM	0	.....	.....	.....	.....	.....	.....
6587	(−)R	7957	(−)R	6	1(−),1*	57	4(−)	117	0	.....
8172	(−)PM	8070	(−)PM	6	.....	.....	6(−)	149	0	.....
8172	(−)PM	8067	(−)R	0	.....	.....	.....	.....	.....	.....
7547	(−)PM	8477	(−)PM	7	.....	.....	7(−)	89	4(−),1(?)	137
7547	(−)PM	8478	(+)PM	6	1(+),1(−)	41, 52	5(−),1(?)	127	1(?)	133
7652	(−)PM	8566	(+)PM	8	.....	.....	8(−)	123	2(−)	153
8181	(−)PM	7958	(−)R	0	.....	.....	.....	.....	.....	.....
7121	(+)PM	6753	(?)PM	0	.....	.....	.....	.....	.....	.....
Totals		.....	.....	38	3(−),1(+),1*	.....	31(−),2(?)	.....	8(−),3(?)	.....

PM = postmortem diagnosis; R = rhinoscopic diagnosis; (−) = negative; (+) = positive; (?) = questionable; *not examined.

7 sows examined postmortem, 2 were found to be positive. At the time these 2 were selected as gilts for breeding, sow 8478 had been called questionable and sow 8566 had been called negative (table 2).

DISCUSSION

It was obvious that despite the favorable status of 11 of 12 sows farrowing the first generation pigs and the negative rhinoscopic examination of all the weanlings, atrophic rhinitis was still present within this group of pigs. This again demonstrated that the rhinoscope was not adequate for diagnosing all affected animals.[2] Postmortem examinations on all the animals of each generation would have been desirable; however, the results of both physical examinations indicate the lower numerical incidence of the disease in the second generation.

Although the number of litters representing the second generation is relatively small, there was also an over-all reduction in the incidence of atrophic rhinitis when judged on a litter basis (table 3). The

TABLE 3—Relationship of Litter Status* to Atrophic Rhinitis

Previous litter status of grandam	Grandam	First generation litter status	Dam	Second generation litter status
(+)	6199	(−)	7627	(?)
(+)	1215	(−)	7957	(−)
(+)	1646	(+)	8070	(−)
(+)	4146	(+)	8566	(−)
(+)	5577	(+)	8477	(?)
(+)	5577	(+)	8478	(+)
(+)	5475	(?)	----	----
(−)	1729	(+)	----	----
(+)	3242-S	(?)	----	----
(+)	3714	(+)	----	----
(+)	5056	(−)	----	----
(+)	5788	(−)	----	----
(+)	5786	(+)	----	----

*The litter status was (+) if 1 pig was positive, (?) if 1 pig was questionable, and (−) if all the pigs were negative following either a rhinoscopic or postmortem examination for atrophic rhinitis.

selection of the litter of dam 5577, the only rhinoscopically positive sow farrowing the first generation, turned out to be a poor one, for the reason that 2 gilts (8477 and 8478) selected from this litter later farrowed pigs accounting for the positive and one of the questionable litters in the second generation. It may have been coincidental, but the negative litter status of dams 8070 and 8566, which in turn originated in positive litters, suggests that the infective agent either became inactive or disappeared.

We believe the main reasons for the apparent lowered incidence of the disease were isolation of the groups, segregation of the litters, and sanitation. In other words, the factor of continuous exposure, which would have been the case in the swine breeding herd at the Agricultural Research Center, was practically eliminated. This appears to be true since the incidence of atrophic rhinitis in the breeding stock of the swine breeding herd for the 1954 spring farrowing season was reduced to less than 10 per cent by elimination of practically all rhinoscopic-positive animals. However, when the spring gilts and boars were examined during the following summer, the incidence of the disease was approximately 40 per cent. Subsequent culling of the affected animals reduced the incidence to less than 5 per cent by the fall of 1954, according to Whitmore.*

CONCLUSIONS

Selection, by means of the rhinoscope, of weanling pigs which are negative to atrophic rhinitis offers no assurance of obtaining animals free of this disease. However, raising such selected pigs in an isolated area under conditions of litter segregation and in a sanitary manner does offer a practical means by which the disease incidence can be minimized.

References

[1]Earl, F. L., and Shuman, R. D.: Atrophic Rhinitis. II. The Rhinoscopic Examination of Swine as a Means of Diagnosing Atrophic Rhinitis. J.A.V.M.A., *122*, (1953): 5.

[2]Shuman, R. D., and Earl, F. L.: Atrophic Rhinitis. III. The Evaluation of the Rhinoscopic Examination for Its Diagnosis. J.A.V.M.A., *122*, (1953): 7.

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Erysipelas Bacterin Complications

When 596 healthy pigs were inoculated with killed *Erysipelothrix rhusiopathiae* adsorbate vaccine in Germany, 26 sickened and 11 died from septicemic erysipelas. The inoculation may have lowered the resistance of the animals against saprophytic form of the organism in their bodies.—*Vet. Bull., April, 1955.*

Diagnosis of Middle and Inner Ear Disease in Rats

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King[1] and Nelson and Gowen[2] described methods for the control and elimination of middle and inner ear infections in rats. Control was based on the diagnosis of the infection in the parent rats at autopsy by inspection of the dissected tympanic bulla. The offspring from noninfected parents were raised with noninfected wild Norway rats as foster mothers. This method of raising noninfected offspring offers considerable promise in the development of a disease-free colony. Difficulties are encountered, however, in procuring suitable foster mothers and a time element of four to five months is necessary to determine whether animals employed as breeders are free from the disease. If they are not free from the disease, new matings must be initiated without promise that the new parents are not infected. Furthermore, although King found that wild Norway rats had a low incidence of middle ear disease, Habermann, Williams, and Thorp[3] later reported that middle ear infection is fairly common in wild Norway rats. This fact would thus make them unsuitable as foster mothers.

It appeared of interest to determine if a diagnosis of the infection could be made without slaughtering the parent rats, thereby eliminating chance matings, together with the four- to five-month waiting period and the necessity of procuring foster mothers.

Attempts were made to devise an otoscopic speculum which would permit visual observation of the tympanic membrane. It was found, however, that it was necessary to use a speculum of such a small bore (less than 1.5 mm.) that insufficient light passed through the lumen from the source to permit a satisfactory examination of the membrane. Consequently, this approach was abandoned as impractical.

In examining the tympanic bulla of normal and infected rats, it is observed that the bulla of the normal rat is thin and has a pearly translucency. An infected bulla, however, loses this translucency, becomes thickened, somewhat roughened, opaque and whitish, while the cavity contains considerable pus. Roentgenograms of normal and infected rats show that the diseased bulla filters out sufficient rays to permit an x-ray plate differentiation between the infected and the normal bulla.

Materials and Method.—The following technique was adopted in taking roentgenograms of rat skulls to diagnose infection of the middle and inner ears.

TABLE 1—X-Ray Diagnosis and Necropsy Findings in Tympanic Bullae of 60 Rats

Age (days)	Colony	Rats (No.)	X-Ray diagnosis			Necropsy findings		
			Pos.	Neg.	Doubtful	Pos.	Neg.	Doubtful
MALES								
60	2	5	2	2	1	2	3	0
100	3	5	0	5	0	0	5	0
100	1 & 3	7	4	2	1	4	3	0
120	3	4	3	1	0	3	1	0
150	3	4	4	0	0	4	0	0
240	2	4	3	1	0	3	1	0
Total	...	29	16	11	2	16	11	0
FEMALES								
60	2	3	0	3	0	0	3	0
100	3	5	1	4	0	1	4	0
110	1 & 3	9	6	3	0	6	3	0
120	3	6	4	2	0	4	2	0
150	3	2	2	0	0	2	0	0
240	2	6	4	2	0	4	2	0
Total	...	31	17	14	0	17	14	0

The rat, under ether anesthesia, was placed in a horizontal position with the head slightly extended so that the incident rays passed dorsoventrally through the skull, the lip of the machine cone being 1/8 inch from the head of the rat. The equipment used was a General Electric model D type 3 machine with a cone 13 inches long and 3 inches in diameter. The other factors were approximately 17 ma., 65 kv., with an exposure of 1/4 second. The rat was properly placed in the true dorsoventral position and held so that no movements whatsoever of the head occurred. In this way, detail and excellent contrast were obtained (fig. 1, 2, 3, 4).

In the infected ear, the thickened bone of the bulla, together with the purulent material, filtered out a considerable number of the rays (fig. 3 and 4). In figure 4, the bulla appears irregular and hazy, while the normal bulla (fig. 1 and 2) filters out very few rays and appears as a black spot on the x-ray plate.

This procedure has been successfully employed as a diagnostic method on over 100 animals from this and other colonies. Table 1 shows the x-ray diagnosis and the necropsy findings in a group of 60 rats from three colonies. In the 2 doubtful cases, the head was not held in the true dorsoventral position which resulted in a superimposition of the post-tympanic hook and, to a lesser extent, the squamosal bones. In both cases, the bullae appear irregular, hazy, and resemble the in-

From the Food and Drug Laboratory, Department of National Health and Welfare, Ottawa, Ont.

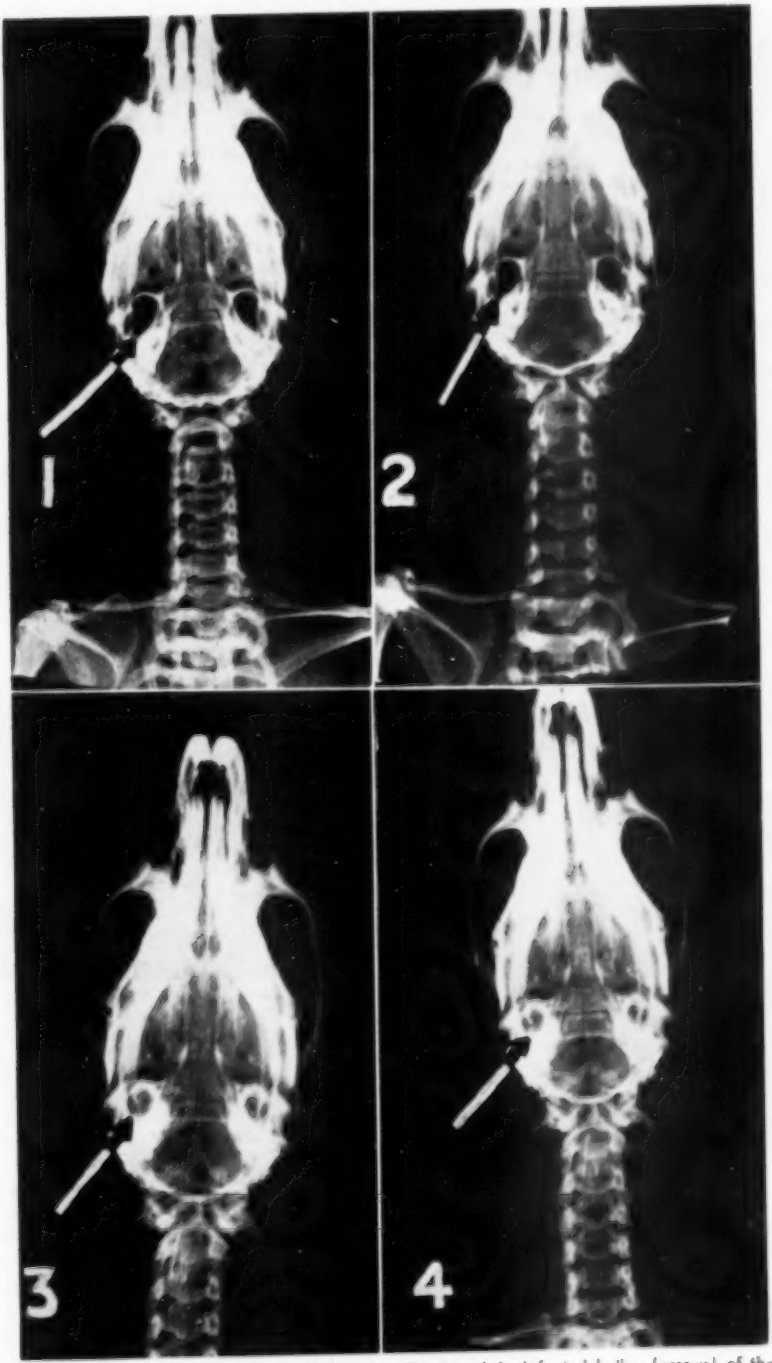

Fig. 1 and 2—Normal bullae (arrows) of the rat. Fig. 3 and 4—Infected bullae (arrows) of the rat.

fected bullae, indicating that the true dorsoventral placement of the head is necessary for x-ray plates of diagnostic value.

Summary.—A method of diagnosing middle and inner ear infection in the live rat is described. The method permits the use of noninfected breeders in a middle and inner ear disease eradication program.

References

[1]King, M. D.: Labyrinthitis in the Rat and a Method for Its Control. Anat. Rec., *74*, (1939): 215-222.

[2]Nelson, J. B., and Gowen, J. W.: The Establishment of an Albino Rat Colony Free from Middle Ear Disease. J. Exper. Med., *54*, (1931): 629-636.

[3]Habermann, R. T., Williams, F. P., and Thorp, W. T. S.: Common Infections and Disease Conditions Observed in Wild Norway Rats Kept Under Simulated Natural Conditions. Am. J. Vet. Res., *15*, (1954): 152-156.

X-Ray Cassette Holder

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The intent of this article is to describe a means of holding an x-ray cassette in a vertical position. This position is necessary in a transabdominal or transthoracic projection of a horizontal x-ray beam (fig. 1).

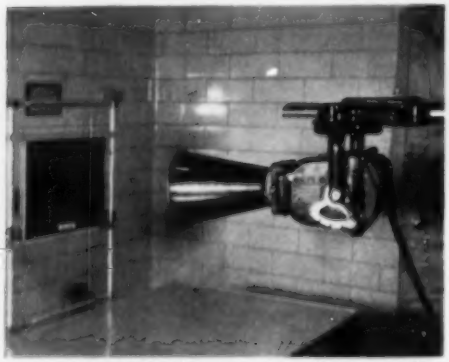

Fig. 1—Cassette holder, cassette, and x-ray machine in place.

The Small Animal Clinic of the Colorado A. & M. College has found an ever-increasing use for this technique. It has proved valuable in demonstrating fluid levels within body cavities or the gastrointestinal tract. Moreover, this technique has provided a more accurate picture of the viscera in its normal position.

The holder was made of ½-inch aluminum alloy conduit on four sides. Two sections of channel iron 1/16-inch thick and 1-inch wide hold the cassette. The lower section was fastened on either end to a block of brass drilled to fit the pipe of the frame. The metal blocks were reinforced with a strip of metal ¾-inch wide and ¾ inch above the bottom channel iron. This section can be moved up or down, allowing adjustment of the cassette within limits of the frame. Set screws hold this section in place. The upper section of channel iron has a hole drilled in either end to allow it to slide up or down the pipes. This part rides free and holds the cassette in place by resting on the upper edge.

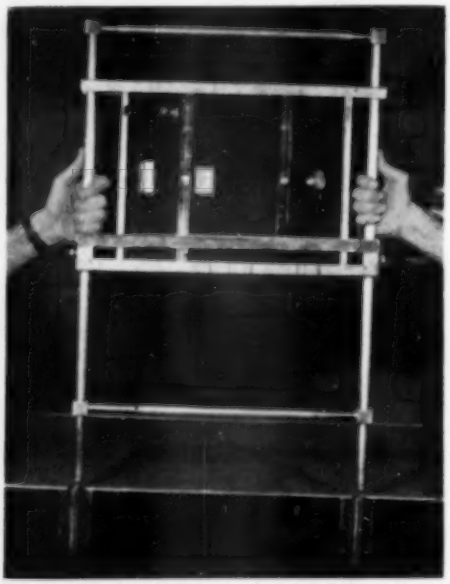

Fig. 2—Cassette holder, back view, being slipped into pipes on side of x-ray table.

The cassette holder can easily be attached to the table (fig. 2). Each side pipe of the holder projects 4 inches below the frame and slips into a 4-inch brass pipe. This brass pipe was welded onto a 4-inch plate of brass 2 inches wide. Each brass plate was bolted to the side of the x-ray table.

From the Veterinary Hospital, Colorado A. & M. College, Fort Collins. Mr. Gray is a registered technician.

Nocardial Mycetoma in a Dog

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THE REPORTED cases of nocardial infections in the dog have been most commonly associated with lesions in the bronchial lymph nodes and lungs.[1] This report concerns a case of nocardiosis causing chronic subcutaneous infection of an extremity (mycetoma) in a 9-year-old male Pointer.

CLINICAL FINDINGS

At the time of presentation, the patient had been treated for one year for a persistent skin disorder involving all the area below the distal third of the left tibia. The owner had first observed multiple cutaneous nodules which eventually ruptured, leaving ulcerous, suppurating lesions that would stop discharging and heal over. This process of nodulation and ulceration followed by suppuration and fibrosis was repeated several times during the course of the disease. Many types of medication were tried, but the most effective treatment was bandaging the foot, which prevented self-mutilation of the affected skin.

When examined at the University of Pennsylvania veterinary hospital, the animal was weak, emaciated, and held the affected limb in constant flexion. There was extreme disuse atrophy of the thigh musculature. The involved distal portion of the limb was greatly enlarged and the dog evinced pain if the area was palpated. The greatly thickened skin was covered with multiple lesions, some of which showed superficial ulceration and exuded a grayish green pus while others were encrusted with scabs.

Because of the chronicity of the disease and the marked deterioration of the patient's general condition, euthanasia was carried out.

PATHOLOGICAL FINDINGS

The skin of the left hindlimb extending from the distal third of the tibia to the toes was reddened, moist, and showed alternate areas of crusts, scabs, and grayish yellow exudate on its surface. The epidermis, corium and subcutis were greatly thickened and were diffusely adherent to the underlying tissues. There were pedunculated exostoses on the phalanges, suggestive of chronic periosteal proliferation. The regional lymph nodes were swollen, moist, and dark red.

Histologically, the skin of the affected areas revealed an extreme, chronic, ulcerative dermatitis. In some areas, there was epidermal hyperplasia, especially of the papillae. The corium appeared markedly thickened with excessive dense collagenous connective tissue and cellular infiltration predominantly macrophages, lymphocytes, and plasma cells. Occasional foci of polymorphonuclear leukocytes were observed, especially in and around hair follicles and sebaceous glands. There was, however, a relative absence of hair follicles.

Histological sections stained with periodic acid-Schiff stain (Kligman's modification)[2] showed branching beaded filaments, which stained dark red, as is typical of fungi when this method is used.

The basic structure of the lymph nodes

Fig. 1—A lateral view of the involved extremity of the Pointer. Note the marked thickening of the limb and the extensive cutaneous ulceration.

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was altered. Germinal centers were few and the parenchyma was infiltrated with large numbers of plasma cells. Edema, congestion, and hemorrhage were present, and macrophages containing pigment were in abundance.

LABORATORY FINDINGS

Direct smears taken from the depth of the involved tissues showed gram-positive, branched, beaded filaments which were partially acid-fast. After four days of aerobic incubation at 37 C., cultures on blood and Sabouraud's agar plates consisted of pinpoint, irregular, granular, chalky white colonies. The organisms observed in smears from these colonies were similar to the organisms in the original smears and specially stained histological sections. When 3 mice, inoculated intraperitoneally with material from the lesion were killed thirty days later, each had eight or ten granular nodules scattered throughout the peritoneal cavity. Cultures and smears from these nodules were identical to those from the original canine tissues. This organism was considered to be one of the various species of Nocardia.

DISCUSSION

The clinical syndrome in this dog is similar to a disease in man, known as maduromycosis, Madura foot, or mycetoma. In man, mycetoma is a distinct clinical entity although it may be caused by a great many different fungi. This disease is much more common in tropical and subtropical countries because few people wear shoes, and wounds of the foot are common. Nocardia is ordinarily saprophytic, but it is potentially pathogenic if it gains access to the deeper tissues of the body. Mycetoma is a chronic, suppurative, granulomatous disease of the subcutaneous tissues of an extremity. It is characterized by abscess formation, draining sinuses, and progressive tissue damage. In long-standing cases there is marked edema and fibrosis which is often accompanied by irreversible bone destruction resulting from a suppurative periostitis and osteomyelitis. The systemic manifestations are due to secondary bacterial contamination of the many draining wounds.

Treatment is best accomplished by sulfonamides combined with surgical debridement and resection of infected sinus tracts.

SUMMARY

A case of chronic subcutaneous infection involving the rear limb of a Pointer has been described. Nocardia was isolated and grown in pure culture from these lesions and was observed in specially stained histological sections. Intraperitoneal inoculation of mice produced multiple peritoneal granulomas from which pure cultures of Nocardia were isolated.

References

[1]Thordal-Christensen, A., and Clifford, D. H.: Actinomycosis (Nocardiosis) in a Dog with a Brief Review of this Disease. Am. J. Vet. Res., *14*, (April, 1953): 298.

[2]Conant, N. S., *et al.*: Manual of Clinical Mycology. 2nd ed. W. B. Saunders Co., Philadelphia (1954): 420.

Dog Research Hero

Flossie, a 12-year-old, fluffy white dog, was given the fourth annual dog research hero award by the National Society of Medical Research in Cleveland. She had been used for testing substances experimentally produced in an attempt to prevent high blood pressure in man.—*Nat. Soc. for Med. Res., Chicago, Ill., Sept. 19, 1955.*

Drug Resistance in Coccidia

Of 40 field strains of allegedly drug-resistant avain coccidia studied, 43 per cent were sensitive to one or more of the drugs generally used, 43 per cent being resistant to nitrophenide, 45 per cent to sulfaquinoxaline, 57 per cent to nitrofurazone; some strains were resistant to all of these drugs. However, all strains were effectively inhibited by nicarbazin at levels of 0.01 per cent of the feed.—*J. Parasitol., June, 1955.*

Curled Tongue in Young Turkeys

The condition in young turkeys in which the tip of the tongue folds back on the dorsum was experimentally produced in Britain in several breeds by feeding a starter mash in a dry state. When the same feed was moistened, new cases did not develop and most of the affected birds recovered. The condition seems apt to occur when 70 per cent of the weight of the mash consists of particles below 1 mm. in diameter.—*Vet. Rec., July 2, 1955.*

A Testing Service for the Control of *Salmonella Typhimurium* Infection in Turkeys—A Progress Report

P. D. DeLAY, D.V.M.; T. W. JACKSON, D.V.M.; D. E. STOVER, D.V.M.; E. E. JONES, D.V.M.; W. W. WORCESTER, D.V.M.

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A DESCRIPTION of a testing service for the control of *Salmonella typhimurium* infection in turkeys and the results of three years of testing, 1949 to 1952, was reported in 1954.[1] It is the purpose of this report to present additional epizootiological data in relation to the problem of maintaining flocks free from *S. typhimurium* and to emphasize those factors which contribute or are related to the introduction of infection.

RESULTS

During the period of July, 1952, to June, 1954, the animal pathology laboratories of the California State Department of Agriculture conducted agglutination tests on the serums of 559,465 birds using *S. typhimurium* antigens (table 1). From 1949 to 1954, the laboratories tested 1,152,806 birds for *S. typhimurium*.

The total number of birds tested in 1953 to 1954 exceeded the number tested in 1950 to 1951; yet the number of infected ranches decreased from 31 in 1950 to 1951, to nine in 1953 to 1954. Diagnoses of *S. typhimurium* infection in individual broods of poults decreased from 122 in 1952 to 41 in 1953 and to 16 in 1954.

Breeding-Flock Infection, 1952 to 1953.—Of the 14 flocks that were found to be infected when tested in 1952 to 1953, eight were progenies of known infected flocks and six were progenies of birds that had been tested and found free from infection. Four of the latter six flocks were brooded either with known infected stock from other sources, or were mixed with birds whose status in relation to *S. typhimurium* was unknown. There was nothing about the history of the remaining two flocks to indicate the possibility of cross infection from other infected poults; hence, it is assumed that the infection was carried to them by mechanical means or was introduced through the medium of free-flying birds, rodents, or other wildlife during the growing period.

Breeding-Flock Infection, 1953 to 1954.—Of the nine flocks that were found to be infected when tested in 1953 to 1954, three were on ranches where *S. typhimurium* infection was either diagnosed in the parent stock or in other turkeys that were brooded with the parent stock, one was the progeny of untested stock, and five were progenies of breeder birds which had been tested in 1952 to 1953 and found free from *S. typhimurium*. The source of their infection was not determined. Here again, it is presumed that the infection was introduced during the growing period.

Poult Infection, 1953.—Outbreaks in poults were possibly attributable to seven breeding flocks which had been tested in 1952 to 1953 and found free from infection. Four of the seven ranches from which the infected poults originated had *S. typhimurium* infection in poults the previous year, and two had infection in poults two years previously. It would appear that the infective agent had remained on these six premises from one year to the next, possibly in wildlife, and then became established in breeder birds following the test in 1952 to 1953. There was nothing about the history of the single outbreak in the progeny of the seventh flock to indicate the source of the infection.

Several outbreaks in poults were traced to five flocks that were found infected when tested in 1952 to 1953. None of the owners of these flocks had complied with the recommendations to dispose of the flocks, or to test until they had obtained two consecutive negative tests. Infection in one brood of poults was traced to a flock in which the

From the Division of Animal Industry, Bureau of Livestock Disease Control, California State Department of Agriculture, Sacramento.

The authors appreciate the assistance of Drs. Stanton L. Jamison and W. H. Armstrong in the examination of reactor birds; of Dr. Alcor Browne, California State Department of Public Health, in serological typing of cultures; and of Dr. R. A. Mueller, manager, California Poultry Improvement Advisory Board, in providing sufficient blood for the Salmonella typhimurium test.

[1]Delay, P. D., Jackson, T. W., Jones, E. E., and Stover, D. E.: A Testing Service for the Control of Salmonella Typhimurium Infection in Turkeys. Am. J. Vet. Res., 15, (1954): 122-129.

TABLE I—Summary of Agglutination-Testing Results—All Ranches for the Seasons 1952 to 1953 and 1953 to 1954

	Ranches with no infected birds				Ranches with infected birds				Totals		No. reactors examined		
Season	No. ranches	No. birds	No. reactors	Reactors (%)	No. ranches	No. birds	No. reactors	Reactors (%)	No. ranches	No. birds	Noninfected ranches*	Infected ranches†	Total
1952 1953	169	265,411	763	0.3	14	40,493	767	1.9	183	305,904	226	78	304
1953 1954	152	229,690	2,186	1.0	9	23,871	497	2.8	161	253,561	291	63	354
Totals		495,101	2,949*	...	...	64,364	1,264†	...	...	559,465	517	141	658

*Salmonella typhimurium not recovered from reactors; †S. typhimurium recovered from representative reactors.

test had been applied to only a portion of the total number of birds.

Other outbreaks in poults in 1952 to 1953 involved 14 untested flocks.

Poult Infection, 1954.—Outbreaks occurred in the progenies of three flocks that had been recently tested and found negative for *S. typhimurium*. The disease was diagnosed in only one lot of poults from each of the three tested flocks, and the poults in two of the infected lots had been hatched and brooded with other infected poults that came from untested sources. Although the third lot of poults originated from a flock that tested negative, *S. typhimurium* had been recovered from breeder birds on this ranch the previous year. Again, it would seem possible that the infective agent remained on the ranch from one year to the next, even though the breeder birds apparently were not infected when tested in the fall of 1953.

On two other ranches, infected flocks were retained by the owners without having had two negative tests following a positive test, and *S. typhimurium* infection was diagnosed in some of the progeny.

Other outbreaks in poults in 1953 to 1954 were traced to six flocks that had not been tested.

Although each year less than half of the breeder birds in the state have been tested for *S. typhimurium*, the incidence of the infection in poults in 1954 was only 13 per cent of what it was in 1952. This might be interpreted to mean that growers who now have their flocks tested formerly contributed most of the infection which caused the poult outbreaks. It is evident, however, that many growers who have never had their breeding flocks tested have benefited from the testing service by purchasing their replacement stock from tested sources free from *S. typhimurium*.

It would appear significant that although most of the breeding flocks are on ranches in the valleys, approximately half of the cases of *S. typhimurium* infection detected by the test were in flocks maintained in coastal or inland foothill areas. Features which might contribute to the survival of the infective agent in the latter areas are the comparatively heavy wildlife population, common occurrence of clay-type soils which do not drain well, and abundant natural shade. The lower incidence of the disease on the ranches in the valleys may be accounted for by the sandy soil, smaller rodent population, and the use of artificial shade.

Summary and Conclusions

1) During the period of July, 1952, to June, 1954, the serums of 559,465 turkeys were tested for the presence of *Salmonella typhimurium* agglutinins.

2) The number of infected breeding flocks decreased from 31 in 1950 to 1951, to nine in 1953 to 1954.

3) The number of outbreaks in poults decreased from 122 in 1952 to 41 in 1953 and to 16 in 1954.

4) As noted in the initial report, those groups or individuals who complied with the recommended disease control measures had little or no *S. typhimurium* infection in poults. Conversely, those who kept infected flocks, or maintained factors which favored perpetuation of infection in the breeder birds, continued to produce most of the birds with *S. typhimurium* infection.

Muscular Hypertrophy of the Ileum in Relation to "Terminal Ileitis" in Pigs—A Preliminary Report

SVEND W. NIELSEN, V.S.

Guelph, Ontario

TERMINAL OR REGIONAL ileitis was established as a clinical and pathological entity in man by Crohn[1] and co-workers in 1932. The disease is a nonspecific, granulomatous inflammation affecting the ileum and the regional mesenteric lymph nodes. Its etiology is unknown and in spite of the histological similarity to tuberculosis and Johne's disease, acid-fast organisms have never been isolated.

Recently, lesions described as resembling this entity have been reported in pigs[2,3] and in dogs.[4] In the first report by Emsbo[2] in Denmark, 52 porcine cases were studied and two main forms of terminal ileitis were established—the muscular type and the mucous type. In the first type, both circular and longitudinal layers of the muscularis propria are enormously thickened. The second, or the mucous, type which also shows muscular hypertrophy, is characterized by a diffuse hyperplasia of the mucosa resulting in a marked folding. It is stated that the mucous type may represent a further development of the muscular type as transitional forms are encountered. Regional ileitis, with perforation and subsequent peritonitis, occurred in 23 of 1,410 pigs necropsied in a two-year period. In a litter of 10 pigs, 3 to 4 months old, 4 died from peritonitis due to a perforating ileitis.

In 1953, Field[5] and co-workers in England described 20 cases of terminal ileitis in pigs. Of 27 pigs in three litters, 12 died from peritonitis due to ileitis. Five showed ileitis when slaughtered at bacon weight. The similarity between the gross lesions and the age incidence in man and pigs is emphasized, together with the discrepancies in the histological picture. The possibility of a familial occurence of this disease in pigs is pointed out.

The purposes of this paper are: (1) to report 3 cases of muscular hypertrophy of the ileum resulting in bowel obstruction with subsequent perforation and peritonitis; (2) to compare them with Emsbo's muscular type of terminal ileitis in pigs and Crohn's disease in man; (3) to discuss the pathogenesis on the basis of histological findings of the ileum of 25 normal pigs; and (4) to differentiate it from necrotic enteritis of swine.

CASE HISTORIES

Case 1.—An 8-week-old Yorkshire gilt, in a pen with 22 other pigs, was fed a prepared dry feed mixture from automatic self-feeders. She was found dead without previous symptoms having been noticed. Another pig was off feed and had a dull appearance, but it recovered without treatment after a few days. The necropsy of the first pig showed an acute fibrinous peritonitis due to feed which had escaped through a perforation of the ileum, 8.0 cm. anterior to the cecum. The perforation appeared as an almost linear, 1-inch oblique rupture of the muscularis with necrosis of the herniated mucosa. The entire ileum, extending to about 30.0 cm. anterior to the

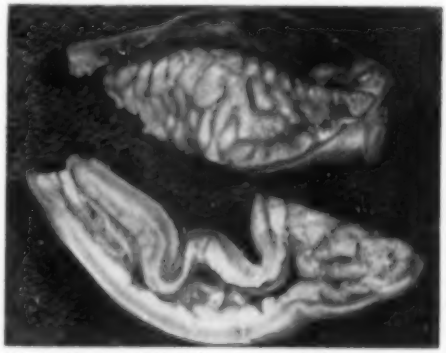

Fig. 1—Two pieces of formalin-fixed ileum near the site of perforation (case 1). Note the dark, congested peritoneal surface of the top piece.

Fig. 2—Cross sections of ileum showing the greatly thickened muscularis and the stenosed lumen (case 1).

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ileocecal junction, was markedly thickened and felt like a rubber hose. The diameter of the ileum was 1.5 cm. except at the point of rupture where a bulbous expansion had taken place (fig. 1). On opening the ileum, the muscularis layer was seen to be greatly increased in thickness (fig. 2). The mucous membrane was corrugated, of normal color, and intact except at the perforation where it appeared necrotic.

Histologically, the mucosa appeared normal with a few eosinophils present. The lymphoid follicles of the submucosa were large and edematous, but not remarkable otherwise. The muscularis showed marked hypertrophy of both layers with acute inflammatory changes of the rupture's edge (fig. 3). On examination, the muscularis in the vicinity of the rupture disclosed no degeneration or atrophy of muscle fibers which could account for a weakening of the muscle layer. The peritoneum in the area was acutely inflamed, with bits of feed particles embedded in a fibrinous exudate (fig. 4).

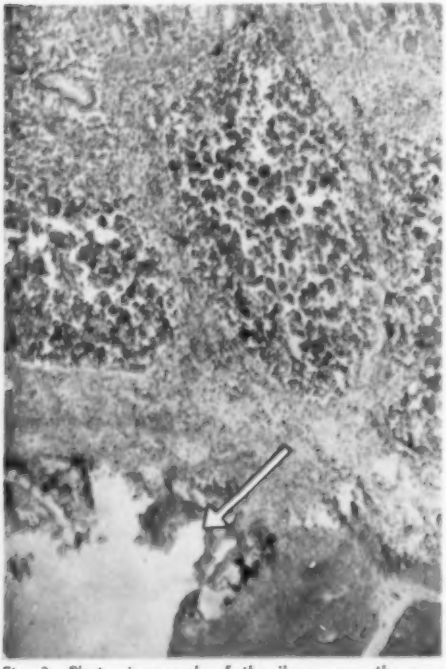


Fig. 3—Photomicrograph of the ileum near the perforation (case 1). Note the large edematous lymphoid follicles and the ruptured muscularis (arrow). x 100.

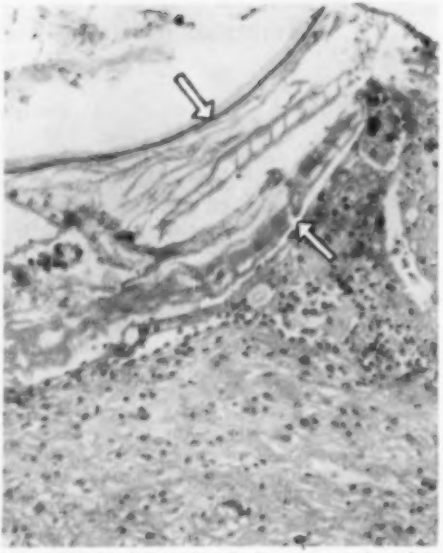


Fig. 4—Photomicrograph of the peritoneal surface of the ileum (case 1), demonstrating a piece of straw (between arrows) with surrounding inflammatory reaction. x 400.

Case 2.—An 8-week-old Yorkshire gilt from a valuable breeding stock was found dead. Her feed had consisted of a dry prepared mixture in self-feeders. On necropsy, an acute fibrinous peritonitis due to a perforated ileum was found. The wall of the ileum showed a greatly thickened muscularis (5 mm.) and a corrugated mucosa (fig. 5) extending about 40 cm. anterior to the cecum. The histological findings of the mucosa and submucosa were the same as for case 1, except for a gradual decrease of height and an acute necrosis of the mucosa at the point of perforation. Marked muscular hypertrophy was the most striking finding in this case also.

Case 3.—Necropsy of a 10-week-old Yorkshire gilt from a government-owned herd of breeding stock, which was fed dry prepared feed in self-feeders, showed an early, localized fibrinous peritonitis around a ball-shaped dilatation of the ileum (fig. 6). The intestinal wall was intact and no feed had escaped into the peritoneal cavity as in the 2 previous cases. On opening the intestine, a marked thickening of the muscularis of the entire ileum was observed. The narrowing of the lumen had resulted in stasis of a ball of coarse feed and straw

about 10 cm. anterior to the ileocecal opening. The histological findings were identical to case 2. Bacteriologically, a mucoid colon organism was isolated from the spleen and it was considered to be a significant factor in producing the peritonitis.

DISCUSSION

The 3 cases described closely resemble the so-called "muscular type" of regional ileitis described by Emsbo. They do not however resemble regional ileitis in man (Crohn's disease). The latter is characterized by a nonspecific, sarcoid type of granulomatous ileitis, colitis, and lymphadenitis. There is also ulceration of the mucosa, a marked thickening of the submucosa, scarring of the serosal surface, often with fistula formation and, in the inflammatory tissue of both intestine and lymph nodes, giant cells and large epithelioid cells can be demonstrated.

In none of the sections from our 3 cases could the above changes be found, and the muscular hypertrophy present in the porcine cases is not seen in Crohn's disease. It is felt that the two previous papers by Emsbo and Field provide insufficient proof to justify the term regional ileitis in pigs. The cases classified in Emsbo's paper under the heading "muscular type of regional ileitis" and the 3 cases described here would be more accurately diagnosed as muscular hypertrophy of the ileum, the "ileitis" being merely a sequence to the hypertrophy and to the ileus.

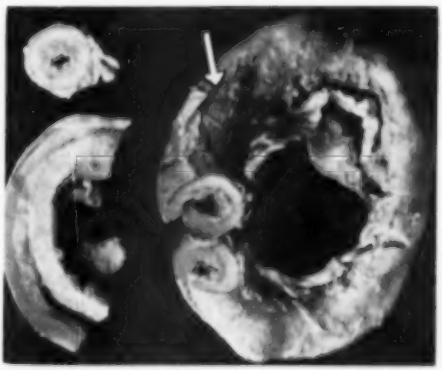


Fig. 5—Sections of ileum showing a thickened muscularis and a fibrinous exudate (arrow) on the serosal surface (case 2).

A study of the normal histology of the porcine ileum was undertaken in an attempt to elucidate the etiology of this condition. The mucous membrane is normally

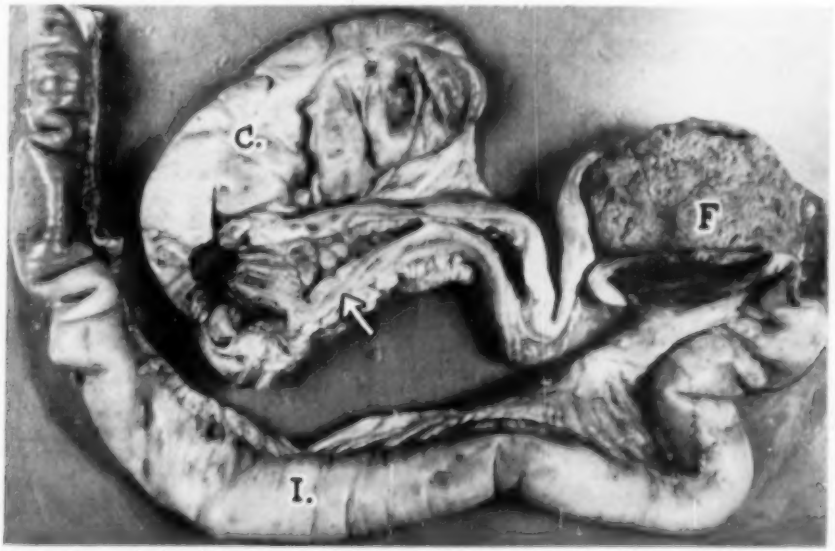


Fig. 6—Cecum (C) and ileum (I) with an impacted ball of coarse feed (F), producing ischemic necrosis of the bowel wall. Note that the muscular hypertrophy (arrow) is posterior to the impaction (case 3).

folded but the plicae circulares are not quite as well developed as in the jejunum. This observation is in agreement with Sloss[7] but opposed to the statement by Titkemeyer and Calhoun,[9] that no circular folds exist in the pig. Numerous goblet cells are present in the tall columnar epithelium of the ileum. The characteristic difference between the other parts of small intestine and the ileum is the abundant lymphoid tissue present here. These lymphoid follicles are located in the submucosa and in greatest number opposite the mesenteric attachment. Their size and number increase toward the cecum. The reported[3] projections of the crypts of Lieberkühn down into the lymphoid follicles is a normal feature of the porcine ileum. The lymphoid tissue seems here to be so abundant that it occasionally breaks the continuity of the muscularis mucosa and infiltrates the lamina propria (fig. 7).

The histological appearance of the mucosa, muscularis mucosae, and submucosa of the ileum in the 3 cases here did not differ essentially from that of normal pigs. The only lesions that could be established were the inflammatory changes associated with the bowel obstruction. These are ischemic necrosis of the mucosa together with marked edema and lymphoid hyperplasia of the submucosa. Hyperplasia of the lymphoid follicles is a common finding in stasis of the bowel, particularly in the ileocecal area.[10] The essential feature was the marked hypertrophy of both circular and longitudinal layers of the muscularis propria. This uniform hypertrophy gradually tapered off toward the jejunum, which was of normal thickness. How the hypertrophy is brought about is difficult to say. The possibility exists that it is either a primary idopathic muscular hypertrophy or a secondary hypertrophy due to a partial stenosis of the ileocecal opening. As no anatomical alteration of this opening can be demonstrated in the dead pig, it is possible that the stenosis is due to a functional, neurogenic disturbance resulting in spasm of the ileocecal sphincter. An analagous condition to this is present in pyloric spasm in man and animals.

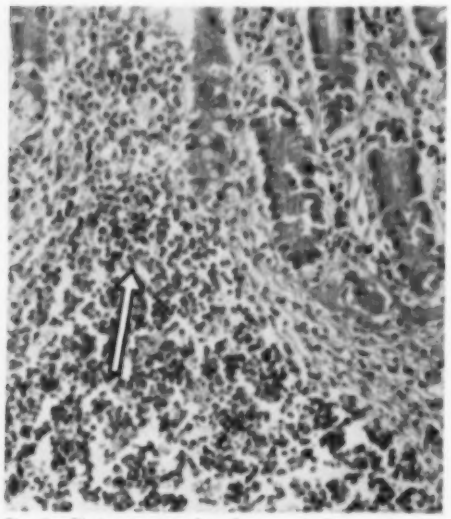


Fig. 7—Photomicrograph of normal ileum showing the extension of a submucosal lymphoid follicle into the mucosa (arrow). x 200.

On the basis of the above, the following is suggested as the sequence of events in the muscular type of regional ileitis of pigs. There is an initial muscular hypertrophy of the ileum with feed impaction resulting in either rupture or secondary inflammatory changes with perforation. The muscular hypertrophy will produce a rigidity of the wall and narrowing of the lumen which, together with a slow peristalsis, may cause a ball of dry, coarse feed to lodge in the ileum. Vigorous contractions with spasm of the smooth muscle will take place around the feed ball, thus cutting off the blood supply and producing passive congestion and edema. This lowers the vitality of the intestinal wall and renders the mucosa vulnerable to toxins and bacteria present in the lumen.

If a traumatic rupture does not take place (as in case 1), with escape of feed into the peritoneal cavity, it is only a matter of time before intestinal bacteria penetrate the ischemic wall and produce peritonitis. Rupture of the intestinal tract due to violent contractions of the smooth muscle is not of uncommon occurrence in horses with severe colic. Rupture of the uterus may occur similarly in the presence of obstetric complications.

Subacute necrotic enteritis affecting the ileum, cecum, and colon in the pig is considered due to a niacin deficiency with a superimposed infection with *Spherophorus necrophorus*, *Vibrio jejuni*, or other potential pathogens. This inflammation is oc-

casionally of such severity that perforation, with peritonitis, occurs. The muscularis is not thickened and the fibrinonecrotic membrane of the mucosa is so characteristic that this disease can easily be differentiated from other forms of ileitis. It should be mentioned that some of the cases included in Emsbo's material fit into our classification of necrotic enteritis of swine.

SUMMARY

A description is given of primary muscular hypertrophy of the porcine ileum, terminating in obstruction, perforation, and peritonitis. The etiology of this disease is discussed and comparison is made with the so-called regional ileitis of pigs and Crohn's disease in man. It is emphasized that only cases showing the characteristic changes of Crohn's disease should be classified as terminal or regional ileitis in pigs.

References

[1]Crohn, B. B., Ginzburg, L., and Oppenheimer, G. D.: Regional Ileitis; a Pathologic and Clinical Entity. J.Am.M.A., *99*, (1932): 1323-1329.

[2]Crohn, B. B.: Regional Ileitis. Grune and Stratton, New York, 1949.

[3]Emsbo, P.: Terminal or Regional Ileitis in Swine. Nord. Vet.-med., *3*, (1951): 1-28.

[4]Field, A. I., Buntain, D., and Jennings, A. R.: Terminal or Regional Ileitis in Pigs. J. Comp. Path. and Therap., *63*, (1953): 153-158.

[5]Hadfield, G.: Recent Advances in Pathology. Churchill, London, 1953.

[6]Neuman, A. W., and Dockerty, M. B.: The Pathology of Regional (Segmental) Colitis. Surg., Gynec. and Obst., *99*, (1954): 572-579.

[7]Sloss, M. W.: The Microscopic Anatomy of the Digestive Tract of *Sus Scrofa Domestica*. Am. J. Vet. Res., *15*, (1954): 578-593.

[8]Strande, A., Sommers, S. C., and Petrak, M.: Regional Entero-Colitis in Cocker Spaniel Dogs. Arch. Path., *57*, (1954): 357-362.

[9]Titkemeyer, C. W., and Calhoun, M. L.: A Comparative Study of the Structures of the Small Intestines of Domestic Animals. Am. J. Vet. Res., *16*, (1955): 152-157.

[10]Trautmann, A., and Fiebiger, J.: The Histology of Domestic Animals. Comstock, Publishing Assoc., Ithaca, N. Y., 1952.

[11]Warren, S., and Sommers, S. C.: Cicatrizing Enteritis (Regional Ileitis) as a Pathologic Entity (120 Cases). Am. J. Path., *24*, (1948): 475-502.

Gossypol, the toxic pigment in cottonseed meal, can probably be eliminated by breeding plants without pigment glands.—*U.S.D.A., Aug. 29, 1955.*

Edema Disease in Swine

In a number of experiments using weaned pigs, Schofield and colleagues at the Ontario Veterinary College were unable to produce signs of edema disease (enterotoxemia) by sudden changes in feed, feeding ingesta of fatal cases, intravenous injection of filtrates of such ingesta, or by giving large doses of botulism toxin. After several feeding experiments with the same feed used in an affected herd, they conclude that there was no evidence that feed had any direct relationship to the disease.

Other experiments indicated that the disease was not related to a thiamine deficiency. Since affected animals often suddenly collapse and die when restrained, and with no signs of edema of the lungs, a histological study was made of the heart muscle. No significant damage to the myocardium was found. The search for etiological factors in the disease continues.—*Canad. J. Comp. Med., Aug., 1955.*

Notes on Erysipelas Vaccination

Pigs vaccinated when 2 to 3 weeks old frequently develop acute erysipelas three to five months later. It is better to wait until they are a little older if possible. Since the passive immunity from anti-swine erysipelas serum alone is short, culture should always be used simultaneously and too much serum may interfere with immunity.

Since acute erysipelas often resembles cholera and since anti-hog cholera serum usually contains erysipelas antibodies, a sick herd not vaccinated for cholera is immediately given cholera serum but the virus may be delayed about nine days. The sick pigs are given erysipelas serum and penicillin in addition. Rarely will the herd have to be vaccinated with erysipelas serum and culture later. Several herds were seen where the immunity was very short after vaccination with swine erysipelas bacterin.—*A. W. Krause, D.V.M., Iowa, in Vet. Sci. News, Univ. of Wisconsin, Jan. 15, 1955.*

Longevity of Anthrax Spores.—Four of 100 samples of Pasteur's anthrax vaccine, preserved in broth between 1884 and 1900, still contained viable spores in 1954. Three samples were fully virulent; the fourth killed 4 of 6 mice.—*Vet. Bull., April, 1955.*

A Preliminary Report of the Flora in Health and Disease of the External Ear and Conjunctival Sac of the Dog

W. GROVER JONES, D.V.M., Ph.D.

Boston, Massachusetts

The lack of information concerning the etiology of infectious conditions of the external ear canal and of infections of the eyes of dogs led to this study. At no place in the literature is there concrete evidence of the types of flora to be found in clinically normal or infected animals, based on a fair sampling of the population. A few investigators have reported on a small number of animals and one[1] has published the results of a study of 200 dogs; however, only predominating microorganisms were enumerated.

Witter[2] has listed *Micrococcus pyogenes* var. *aureus* as the prevailing etiological agent in cases of suppurative or purulent otitis externa. Farrag and Mahmoud,[3] while investigating otorrhea in dogs, found a high incidence of *Pseudomonas aeruginosa*. During a two-year period, 200 cultures by McBride[1] indicated *M. pyogenes* var. *aureus* and *albus* and Streptococcus spp. to be most common in occurrence. *Pseudomonas aeruginosa* and *Escherichia coli* were found to be most resistant to treatment.

Of 17 cases of otitis externa cultured by Dam,[4] 16 were found to be *M. pyogenes* var. *aureus* and one *Ps. aeruginosa*. He observed that all of the micrococci varied in their sensitivity to antibiotic discs.

Formston[5] and Morgan[6] have attempted to review diseases of the eye in animals, but no reference was made to infectious conditions with a defined etiology.

PROCEDURE

Cultures were made of an estimated 90 per cent of all hospitalized clinical cases of canine otorrhea and keratoconjunctival conditions presented at the Angell Memorial Animal Hospital between April and September of 1954. Sterile cotton swabs were used in the external ear canals, to avoid any contact with hair surrounding the canals. The swabs were immediately rinsed in sterile tryptic digest broth. Otic conditions resembling mycotic involvement were also cultured on Sabouraud's slants. All optic cultures were made by passing a heat-sterilized platinum loop under the nictitating membrane and inoculating tubes of tryptic digest broth. The cultures were submitted to the bacteriology laboratory of the Peter Bent Brigham Hospital in Boston for identification by standard methods. Those results listed for normal eyes (table 2) were taken from animals with no apparent clinical ophthalmic conditions.

RESULTS

The results of cultures from external ear canals have been shown in table 1 regardless of the known pathogenicity of the microorganisms. In many instances, only the genus or general classification has been shown. In these cases, it can not be said that a pathological condition is impossible, but they have been shown to be rare.

A total of 128 cultures were taken from the external ear canals of 78 dogs. Cultures were made of 28 normal and 29 infected eyes. Since only the conjunctiva and external corneal surfaces were available for culture techniques, no implication of deep-seated ocular conditions is intimated. An effort was made to determine the normal flora of the kerato-conjunctival area, as well as to define the etiological agents of conjunctivitis, corneal ulcers, and keratoconjunctivitis. These results are listed in tables 2 and 3.

DISCUSSION

According to the results tabulated in this preliminary work, in cases of otitis externa, *M. pyogenes* var. *aureus* has been

TABLE 1—Microorganisms Demonstrated in Otic Conditions of 78 Dogs

Microorganism	Ear		Total
	Right	Left	
Micrococcus pyogenes var. aureus	17	17	34
Proteus vulgaris	14	15	29
Pseudomonas aeruginosa	8	9	17
Escherichia coli	4	5	9
Micrococcus tetragenus	1	1	2
Alcaligenes fecalis	1	3	4
Streptococcus durans	1	1	2
Klebsiella pneumoniae	1	0	1
Proteus mirabilis	2	1	3
Aerobacter aerogenes	1	3	4
Bacillus subtilis	7	9	16
Streptococcus fecalis	1	3	4
Bacterium mycoides	0	1	1
Alpha hemolytic Streptococcus	5	2	7
Beta hemolytic Streptococcus	5	4	9
Nonhemolytic Streptococcus	5	7	12
Enterococci	3	2	5
Micrococci	0	4	4
Diphtheroids	8*	6	14
No growth (clinical)	8	5	13
No growth (normal)	1	1	2

*Clinical otitis externa

Dr. Jones was an intern at the Angell Memorial Animal Hospital, Boston, at the time of these studies.

This study was made possible through the research grant of Mrs. Brewster Sewell to the Massachusetts Society for the Prevention of Cruelty to Animals and the Angell Memorial Animal Hospital.

The author acknowledges with gratitude the technical assistance of Miss Alice Kaprielian of the Peter Bent Brigham Hospital, Boston, Mass.

shown to be predominant, but contrary to those data reported by other investigators, *Proteus vulgaris* was shown to have a frequency of occurrence that closely approached it. *Pseudomonas aeruginosa* was found to be present only half as often as *M. pyogenes* var. *aureus* and approximately one third as frequently as the combined incidence of *M. pyogenes* var. *aureus* and *P. vulgaris*.

Thirteen cultures that produced no growth were taken from animals with clinical otitis externa. Only one clinically normal ear was cultured and no growth was obtained.

In order of occurrence, *M. pyogenes* var. *aureus*, *P. vulgaris*, and *Ps. aeruginosa* were found to be most prevalent. It may be noted (table 2) that *M. pyogenes* var. *aureus* was also demonstrated in clinically normal eyes.

No effort has been made to evaluate the significance of the occurrence of the other microorganisms listed in the tables for all conditions. All of the Corynebacterium probably should be grouped with the diphtheroids, *Streptococcus fecalis* placed in the enterococci group, and a differentiation made between pathogenic and nonpathogenic *Esch. coli*. *Micrococcus tetragenus* is acutely pathogenic for mice and, to a lesser degree, for guinea pigs. It is possible that its occurrence in dogs is of significance. No evaluation has been attempted for other bacteria demonstrated because of a lack of a sufficient number of animals.

Without enumerating specific case histories, the extreme variability of the clinical manifestations in relation to the bacteriological results have been demonstrated by cases of otitis externa showing a sanguineous exudate and marked hyperplasia with no growth when cultured; purulent exudate with *M. pyogenes* var. *aureus* cultured; marked inflammatory hyperplasia and no exudate with *M. tetragenus* cultured; and dry external ear canals and marked hyperplasia with *M. pyogenes* var. *aureus* cultured. Blue-green purulent exudates were found with *Str. fecalis* cultured. These are only a few examples of the extreme variability encountered.

Witter[2] has noted that in chronic otitis externa the epithelial layers become five times as thick as normal. Glands resembling ceruminous glands were visible in the connective tissues taken from the external opening of the ear canal and increased slightly in number deeper in the canal. These glands were not found to be present in normal tissues. This thickening of the lining of the ear canals and the presence of glands may offer much toward an explanation of the resistance of these conditions to treatment. A combination of these phenomena, an incorrectly chosen antibiotic, and resistant microorganisms are not conducive to a therapeutic alleviation of the conditions.

TABLE 2—Bacteriological Results of Cultures from Clinically Normal Eyes

Microorganism	Eye		Total
	Right	Left	
Micrococcus pyogenes var. aureus	4	3	7
Streptococcus fecalis	2	1	3
Corynebacterium pseudodiphtheriticum	1	0	1
Corynebacterium xerose	1	0	1
Hemophilus influenzae	1	0	1
Micrococcus tetragenus	1	0	1
Micrococci	4	4	8
Diphtheroids	2	2	4
No growth	5	10	15

TABLE 3—Bacteriological Results of Cultures from Pathological Ocular Conditions

Microorganism	Eye		Total
	Right	Left	
Micrococcus pyogenes var. aureus	7	4	11
Pseudomonas aeruginosa	2	1	3
Proteus vulgaris	2	2	4
Micrococcus tetragenus	0	1	1
Streptococcus fecalis	0	1	1
Escherichia coli	0	1	1
Diphtheroids	0	1	1
Micrococci	0	1	1
No growth	1	2	3

Summary and Conclusions

A total of 128 cultures were taken from the external ear canals of 78 dogs. In order of occurrence, *Micrococcus pyogenes* var. *aureus*, *Proteus vulgaris*, and *Pseudomonas aeruginosa* were found most prevalent.

Cultures were made of 28 normal and 29 infected eyes, representing 27 animals.

In conclusion, it may be said that the total number of animals examined bacteriologically is insufficient. Normal values, even for the greater Boston area, can not be established on the basis of the work currently completed. Additional work is being carried on at this hospital.

References

[1]McBride, N. W.: Persistent Otorrhea in the Dog. Proc. Book. AVMA (1953): 247-252.

[3]Witter, R. E.: Diseases of the External Ear Canal of the Dog. Cornell Vet., *39*, (1949): 11-31.
[4]Farrag, H., and Mahmoud, A. H.: Otorrhea in Dogs Caused by *Pseudomonas Aeruginosa*. J.A.V.M.A., *122*, (1953): 35-36.
[5]Dam, A.: Studies on the Bacterial Flora in Otitis Externa in Dogs. Nord. Vet.-med., *4*, (1952): 1207-1210.
[6]Formston, C.: Observations on Diseases of the Eye in Animals, with Particular Reference to the Dog. Vet. Rec., *64*, (1952): 47-49.
[7]Morgan, O. G.: Ocular Conditions in Animals. Vet. Rec., *64*, (1952): 49-51.

Mycetoma in a Dog

H. R. SEIBOLD, V.M.D.

Auburn, Alabama

Mycetoma (maduromycosis, Madura foot) in man is a chronic infection affecting usually the feet and, rarely, the hands or other parts of the body. It is caused by a variety of filamentous fungi belonging to different species and genera, and is characterized by the development of tumefactions and sinuses.[1] It occurs throughout the world but is more common in tropical and subtropical countries in persons who do not wear shoes.[2] Mycetoma pedis, occurring in dogs and attributed to infection with Aspergillus sp. is mentioned by Riser.[3] This article describes a lesion of mycetoma in a dog caused by a brown-pigmented fungus with morphological similarity to *Allescheria boydii*.

Fig. 1—Microcolony or "grain" of fungus in tissue showing folds of mycelial mat. x 80.

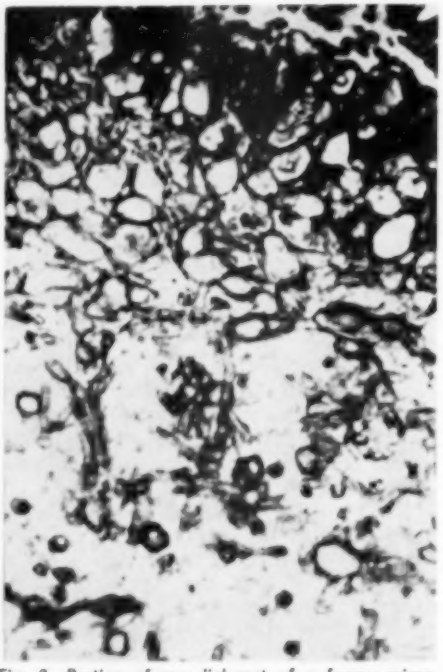


Fig. 2—Portion of mycelial mat of a fungus microcolony in tissue showing branched, segmented hyphae and chlamydospores. x 455.

A 3-year-old female Greyhound* had a tumor-like lesion on the posterior part of the left front foot dorsal to the large pad and extending down the foot under the pad and into that part of the foot that corresponds to the palm of the hand. A small growth also extended to the dorsal surface of the corresponding web of the foot. The lesion was removed surgically and was forwarded to the Department of Pathology,

From the Department of Pathology and Parasitology, Alabama Polytechnic Institute, Auburn. Approved as paper No. 524 by the Committee on Publications.

*Submitted by Dr. C. E. Bild of Miami, Fla.

Alabama Polytechnic Institute, in formalin solution for diagnosis.

Histopathological examination of the lesion revealed numerous large microcolonies (grains or granules) of a brown-pigmented fungus embedded in a mass of inflammatory tissue and exudate. Each fungus colony consisted of a mat of dense mycelial growth that was irregularly folded and bent upon itself like a wad of crumpled paper. In histological cross section, the colonies were not compact in appearance, but consisted of a group of either discreet or connected folds of mycelial mat, sometimes having a lateral opening that allowed cellular exudate to infiltrate into the core or center of the fold (fig. 1).

The brown-colored hyphae were large, segmented, and branched and showed numerous rounded swellings or chlamydospores, especially near the periphery of the folds (fig. 2). The cellular exudate immediately around the entire grains or microcolonies, and within the folds, consisted of granulocytes, macrophages and occasional giant cells. Immediately peripheral to the loose cellular exudate around each colony or grain there was a zone of vascular granulation tissue heavily infiltrated with granulocytes, macrophages, lymphocytes, and plasma cells in varying proportions. Many of the macrophages were laden with hemosiderin. The entire lesion was composed of many such fungus-containing inflammatory nodules separated from each other by septae of dense fibrous tissue. The lesion was overlaid with skin and appeared to have developed in the dermis and subcutaneous tissue.

A precise identification of the fungus could not be made on the basis of its histological appearance alone and without cultural studies.* The granules were similar in some respects to those produced by *A. boydii*, the most probable identification of the fungus by histological examination.

References

[1]Conant, N. F., Smith, D. T., Baker, R. D., Calloway, J. L., and Martin, D. S.: Manual of Clinical Mycology. 2nd ed. W. B. Saunders Co., Philadelphia, 1954.

[2]Skinner, C. E., Emmons, C. W., and Tsuchiya, H. M.: Henrici's Molds, Yeasts, and Actinomycetes. 2nd ed. John Wiley & Sons, Inc., New York, N. Y., 1947.

[3]Hoskins, H. P., Lacroix, J. V., and Mayer, K.: Canine Medicine. American Veterinary Publications, Inc., Evanston, Ill., 1953.

*Sections of the lesion were reviewed by Dr. C. W. Emmons of the Laboratory of Infectious Diseases, National Microbiological Institute.

PPLO in Pneumonia of Swine

Pleuropneumonia-like organisms (PPLO), which have often been reported in the respiratory tract of swine, were found in the lungs selected for study of all of 14 pigs under 2 months of age. Six of these pigs had pneumonia only and 8 had pneumonia with extensive fibrinous serositis (pleuritis, pericarditis, and peritonitis). PPLO, the only organisms recovered from most of these cases, were not found in the lungs of 23 normal animals examined. The histopathology of the lungs was essentially the same as that reported by various workers with virus pneumonia of pigs, except that lymphoid hyperplasia was not marked. Whether the PPLO are primary or secondary factors in this disease is not known but because of their culturing peculiarities, they could have been overlooked in some experiments on virus pneumonia.—*G. R. Carter and J. E. Schroder, Ontario Vet. College, in J. Comp. Med., July, 1955.*

Shipping Fever Prophylactics

The Health of Animals Division of the Canadian Department of Agriculture has sponsored a full page notice in the *Canadian Journal of Comparative Medicine* (Aug., 1955), stating that "the distribution of antiserum by the department for use at public stockyards where cattle are assembled for shipment is being discontinued." This is the result of an experiment in which 6.5 per cent of 4,000 cattle given serum before shipment developed shipping fever and 35 died, whereas, of 3,200 untreated controls 5.4 per cent sickened and 30 died. Of the 2,100 inoculated with bacterin prior to shipment, 2.3 per cent sickened and 10 died. The Department is continuing research, hoping to find a more effective bacterin.

Ring Test in Caprine Brucellosis.—When the Brucella ring test, used on the milk of goats, was compared to the rapid plate agglutination test in the same animal, there was no correlation when only the typical ring formation was considered. However, results were more comparable when all abnormal ring test reactions were included. —*Vet. Bull., July, 1955.*

Tuberculosis in Laboratory Monkeys

A tuberculin test (intradermal palpebral) of 303 monkeys (*Macaca mulatta*) in February, 1953, revealed 17 reactors, 16 of which showed lesions. As repeated, frequent tests failed to control the disease, in May all were disposed of except 45 which were involved in an experiment. These were moved to isolation quarters and the reactors responded well to drug therapy.—*Am. Rev. Tuberc. and Pulmon. Dis., August, 1955.*

Deaths in Man Due to Rabies

In the 21 years from 1932 to 1952 inclusive, 901 deaths from rabies have been reported in man in the United States, an average of approximately 43 per year. However, the number has been decreasing, averaging 70 per year for the first five years of that period compared with 19 per year in the last five years. The highest number was 80 in 1934, the lowest was 10 in 1949.—*J.Am.M.A., July 30, 1955.*

Rectal Carcinoma in a Dog

A male Boxer, 4-years-old, developed a bowel disturbance characterized by bloody, soft stools. Medication and a change in ration gave little improvement. Laboratory findings were within normal range except for an elevated sedimentation rate.

Radiographic studies were made with the aid of barium enemas. The films showed three filling defects (fig. 1 and 2). These were interpreted as tumor of the rectum, and a biopsy obtained from the lesion was diagnosed as an adenocarcinoma of the rectum. Euthanasia was advised.—*W. C. Banks, D.V.M., Texas A. & M. College, College Station.*

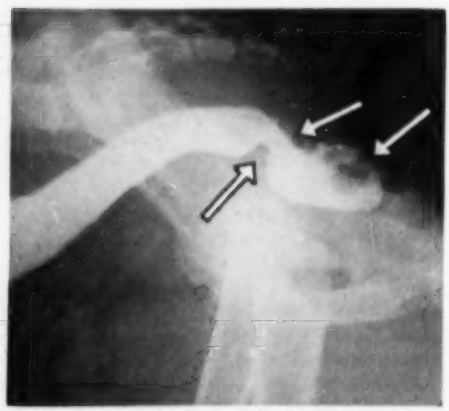


Fig. 1—Radiograph showing the lateral view of the pelvis of a Boxer. The posterior bowel is filled with barium solution; arrows show the three filling defects.

Fig. 2—Dorsal-ventral view of the pelvis of the Boxer showing the filling defects (arrows).

Roentgen Therapy in Venereal Granuloma

Rapid and complete regression of a vaginal tumor in a case of venereal granuloma in a Boston Terrier is reported (*North Am. Vet.*, Oct., 1954), following seven treatments with 2,244 roentgen units spaced over 22 days.

The patient was restored to normal health.

Canine venereal granuloma is a transmissible tumor, composed of mononuclear (round) cells resembling lymphocytes, found on the penis and prepuce of the male and in the vagina of the female. Metastasis has been reported but is probably rare. Spontaneous disappearance followed by immunity is also known. Death from extension and possible metastasis causing urinary obstruction and uremia has also been reported.

What Is Your Diagnosis?

Because of the interest in veterinary radiology, the JOURNAL publishes this month, and will continue to do so for the next several issues, a case history and accompanying radiographs depicting a diagnostic problem.

Make your diagnosis from the picture below — then turn the page ▸

Figure 1

History.—A 4-month-old male Boxer developed an acute swelling of the right lower jaw with a gingival ulcer and some incisor teeth missing. The pup had been fighting with its littermates and the owner suspected an abscess.

A radiograph was taken (fig. 1).

(Diagnosis and findings are reported on next page)

Here Is the Diagnosis

(Continued from preceding page)

Diagnosis.—Osteogenic sarcoma.

Comments.—The radiograph shows mass destruction of the mandible. Notice that the invasion has not advanced beyond the boundary of the symphysis. A photograph of the lesion (fig. 2) shows massive swelling of the affected jaw, and ulceration with a loosened tooth hanging from the ulcer (arrow). Such a lesion is rare in dogs of this age.

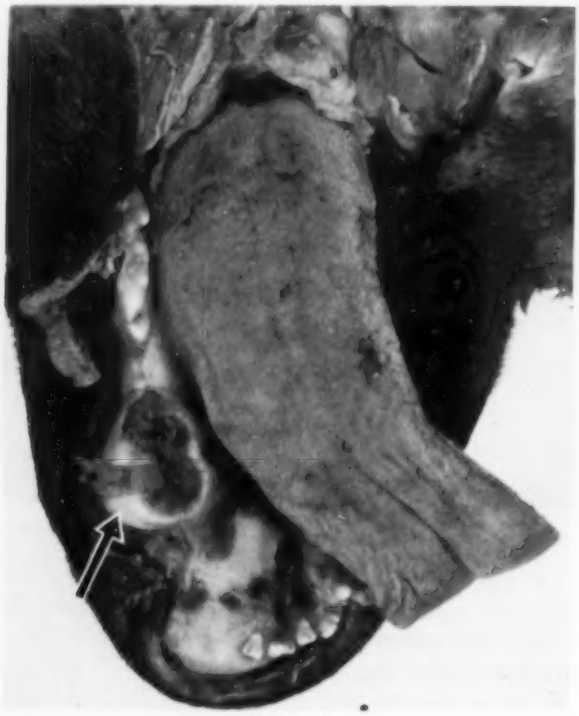


Figure 2

Our readers are invited to submit case histories, radiographs, and diagnoses of interesting cases which are suitable for publication.

This case report was submitted by Drs. T. J. LaFeber and Jean Beckwith, Niles, Ill.; Jack Marcus, Lake Forest, Ill.; and Edna Guibor and E. Wm. Brooks, Skokie, Ill.

The Effect of Roughage on the Number of Eggs of *Haemonchus Contortus* per Gram of Feces from Experimentally Infected Calves

GEORGE W. KELLEY, Ph.D.

Lincoln, Nebraska

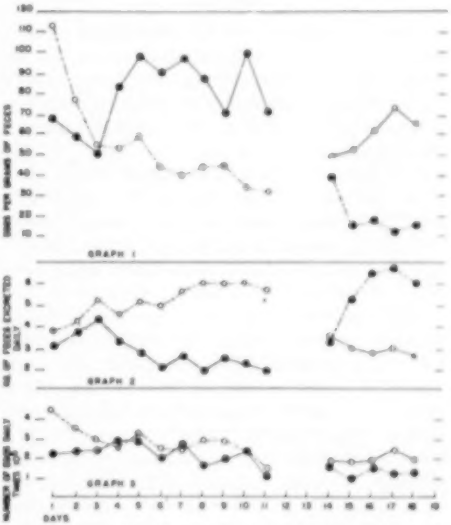
STUDIES OF helminthiasis of cattle are usually based on the number of parasite eggs per gram (e.p.g.) of feces since, in theory, there should be a direct relation between the number of female worms in the alimentary tract and the number of eggs present in the feces. Egg counts per gram of feces do not measure the number of sexually immature female and male parasites, nor do they take into account variation in egg production due to suppression or stimulation by various factors. In spite of these shortcomings, the measurement of e.p.g. remains a workable tool for parasitological investigations. It is thus important that factors affecting e.p.g. be understood as well as possible.

Guberlet (1921)[1] observed that fasting, constipation, and diarrhea affected the number of *Haemonchus contortus* eggs in a definite amount of sheep feces. Mayhew (1940)[2] found that excessive amounts of hay in the rations of calves lowered their e.p.g. While doing egg counts on calves which were used for other experiments, it was observed that when the animals became ill from unrelated infections they often had higher egg counts than when they were healthy. When these animals were examined postmortem, they were found to be only moderately parasitized compared with healthy calves that had lower egg counts. The increased egg counts in sick animals may, therefore, have been due to anorexia and reduced ingestion by the host. The amount of roughage in the ration of the host appeared to be a cause of variation in the number of helminth eggs in the feces. To determine the effect that rations with differing amounts of roughage, but the same total digestible nutrient (t.d.n.), would have on the number of eggs per gram of feces from calves infected with *H. contortus*, the following experiment was performed.

METHODS

During the summer of 1954, observations were made on 5 Holstein-Friesian steers which had been experimentally infected with *H. contortus*. These steers were kept in individual box stalls. Infection with other helminths was prevented by frequent renewal of their bedding and periodic rotation to clean concrete-floored stalls. With the exception of an occasional Trichuris egg in the feces of 1 calf, *H. contortus* eggs were the only helminth ova found during the observations. Prior to the experiment, the calves were fed alfalfa hay, oats, and cracked corn, free choice. No hay or grain was fed calves the day before beginning the test rations.

Group A consisted of 3 calves and group B of the remaining 2 animals. Group A received a ration high in roughage for 11 days, then was switched to a low-roughage ration for an additional eight days. Group B received the ration low in roughage for 11 days, then was switched to the high-roughage ration for an additional eight days. The rations were reversed to eliminate the effects



Graphs 1-3—Graphic illustration of the number of eggs of Haemonchus contortus in the feces of two groups of calves (O = group A and ● = group B) while being fed two types of ration (——— ration with low amount of roughage and ..... ration high in roughage). The rations were reversed for the groups on the eleventh day. Graph 1 gives results in eggs per gram of feces. Graph 2 shows kilograms of feces excreted daily. Graph 3 shows the total number of eggs produced daily.

From the Department of Animal Pathology and Hygiene, University of Nebraska, Lincoln. Published with the approval of the director as paper No. 702, journal series, Nebraska Agricultural Experiment Station.

of any loss of parasites during the observational period and to provide a replication of the experiment. The high-roughage ration consisted of ¾ lb. of soybean oil meal and 6 lb. of chopped alfalfa hay. The low-roughage ration consisted of ½ lb. of soybean meal, 3 lb. of cracked corn, and 1 lb. of chopped hay. The high-roughage ration had a t.d.n. of 37.0 per cent and weighed 6¾ lb. The low-roughage ration had a t.d.n. of 36.5 per cent but weighed only 4½ lb. The calves were given their ration and 2 gal. of water at 8:00 a.m. and an additional 2 gal. of water at 5:00 p.m. Minerals were supplied by sprinkling approximately 300 Gm. of bone meal on each ration.

The feces were picked up from the concrete floors and weighed at 8:00 a.m. and at 5:00 p.m. daily and, after being thoroughly mixed with a wooden paddle, samples for egg determinations were taken.

Egg counts were done by the Stoll-Lane direct centrifugal flotation method (Stoll, 1930),[3] using saturated sodium nitrate solution for the flotation medium. Counts were made on both the morning and afternoon collections and averaged to obtain the daily e.p.g. The number of eggs produced daily was calculated by multiplying the daily e.p.g. by the amount of feces collected.

RESULTS

Average egg counts for the group on low roughage rose from an initial 69 to 99 e.p.g. on the tenth day, while the count for the calves on the high-roughage ration decreased from 113 to 34 e.p.g. When the rations were exchanged, the e.p.g. of the calves now receiving the high-roughage ration decreased from 41 to 18, while the e.p.g. of those now on the low-roughage ration increased from 61 to 74 (graph 1).

The amount of feces excreted daily was also related to the ration (graph 2).

The number of eggs produced daily showed no relation to the ration and was the most constant measurement observed. After a rather sharp decline in the high-roughage calves, the two groups approximated one another and, with only slight daily variations, they showed a gradual decline to the end of the observations (graph 3). The difference existing between the two groups of calves at the beginning of the experiment can not be accounted for.

DISCUSSION

The influence of roughage on egg counts probably results from the dilution of the eggs by the undigestible material in the ration. Greater amounts of roughage result in more undigestible substance, causing the calf to excrete a greater amount of feces. Because the egg production of the parasites is relatively constant, the number of eggs per gram of feces is decreased when the volume of feces is increased by the addition of roughage to the ration.

The number of eggs per gram of feces should not be considered a direct indication of the degree of an animal's parasitic infection but instead may reflect changes occurring in the parasitic fauna due to weather conditions, duration of infections, age of host, and seasonal differences. It is a relative measurement which will vary as egg production varies. When egg counts are made on a herd basis, much of the individual variation is eliminated and e.p.g. becomes a reliable measurement of changes in worm burden from period to period as long as the rations remain the same. Worm egg counts can not be relied on to measure differences between herds maintained under different conditions, *i.e.*, feedlot and range. Nor can they be used as a reliable diagnosis of parasitic disease because the affected animals generally have accompanying digestive disorders which can affect egg counts.

SUMMARY AND CONCLUSIONS

1) Experiments on two groups of calves, having pure infections of *Haemonchus contortus*, demonstrated that the roughage content of the ration affected the number of eggs per gram of feces (e.p.g.). Egg counts were inversly proportional to the amount of roughage fed and to the amount of feces excreted.

2) The total number of eggs produced daily was not influenced by the amount of roughage in the ration.

3) The rations of cattle should be considered when epizootiological studies are based on egg-per-gram counts. Care should be exercised so that illness is not diagnosed as parasitism on the basis of e.p.g.

References

[1]Guberlet, J. E.: Studies on the Sheep Stomach Worm—*Haemonchus Contortus* Rud. J.A.V.M.A., *59*, (1921): 716-721.

[2]Mayhew, R. L.: Studies on Bovine Gastro-Intestinal Parasites. IV. Influence of Hay Consumption on Egg Counts. Cornell Vet., *30*, (1940): 495-498.

[3]Stoll, N. R.: On Methods of Counting Nematode Ova in Sheep Dung. Parasitology, *22*, (1930): 116-136.

Chick-Propagated Foot-and-Mouth Disease Viruses

Holland types A, O, and C of foot-and-mouth disease virus were each transferred in day-old chicks for 35, 24, and 20 serial passages, respectively, by intravenous inoculation with infected gizzard muscle suspensions which had been tissue cultured. When bovine-propagated virus was used, only type O was successfully transferred. This caused no mortality in the chicks but on necropsy, macroscopic lesions in the gizzard in most and heart lesions in a few chicks were seen. The greatest concentration of virus was in the gizzard and reached its maximum two days after inoculation. Neutralizing antibodies were found 28 days after chickens 6 weeks of age were given type A virus. Chick-propagated types A and C viruses were pathogenic for cattle.—*Cornell Vet., April, 1955.*

The Occurrence in West Pakistan of a Disease Resembling Avian Monocytosis or Pullet Disease in America

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During routine disease investigation and laboratory diagnostic work, diseased chickens were found which showed symptoms and lesions like those described in avian monocytosis or the so-called "pullet disease" in America. As no epizootic developed, they were thought to be affected by some other disturbance. However, the disease assumed epizootic proportions in October and November, 1954, when a rapidly fatal cholera-like disease, affecting a large number of chickens, appeared in two widely separated flocks. The birds involved in these outbreaks were predominantly Rhode Island Red hens in good condition. A few were Leghorns. All were vaccinated against Newcastle disease and fowlpox and were fed exclusively on broken wheat and grain.

The sick birds showed great depression, inappetence, distention of the crop with sour smelling contents, darkening of the comb (bluish), dry scaly skin, particularly the shanks, and rapid death. In protracted cases severe prostration, difficult breathing, impaired vision, and diarrhea were also observed.

The sick birds were treated with castor oil and sulfamethazine or antibiotics without success. None, except a few Leghorns, recovered. When 1 typically diseased Leghorn hen received for observation was given potassium dichromate in drinking water (1:4,000) and molasses in mash, she responded quickly.

The microscopic lesions at necropsy were variable except that the spleen and the proventriculus invariably appeared normal. Some birds showed signs of pulmonary congestion and catarrhal hemorrhagic enteritis. Enormous swelling of the kidneys and distention of the ureters were the predominant features, particularly in the first outbreak. All the visceral, pleural, and peritoneal surfaces were encrusted with a chalky deposit, which was sometimes well marked on the heart. This was confined to the surfaces of the organs with the exception of the kidneys where there was some deeper involvement. Microscopic examination of the visceral encrustations revealed the presence of small needle-like crystals.

The fact that a large number of birds were affected simultaneously suggested that the disease was of an infectious nature. Consequently liver, spleen, and brain suspensions in saline from typically diseased birds were inoculated separately into apparently healthy chicks, mostly Rhode Island Red pullets, with no signs of illness resulting.

Cultures from heart blood and bone marrow of several dead birds yielded micrococci frequently and gram-negative rods occasionally. The gram-negative rods, on lactose, glucose, maltose, sucrose, and mannite mediums, gave typical *Escherichia coli* reactions and were indole-positive and H_2S-negative. Doses of a 24-hour culture, 1 cc. given subcutaneously, failed to infect 3-month-old chicks. Further, the culture was not agglutinated by pullorum or bovine pasteurellosis-positive serums.

The blood of 5 sick birds had average values for hemoglobin of 15.8 Gm./100 cc. and a 12.2 per cent monocytic count, suggestive of hemoconcentration and monocytic shift, respectively.

Discussion.—Many disorders are the re-

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The author thanks Mr. Tasadduq Hussian for making the monocytic counts.

sult of malnutrition, mismanagement, and toxemias, and there was a history of excessive feeding of wheat to these birds. Quigley[1,2] secured some evidence that avian monocytosis might be a form of wheat poisoning. He demonstrated that nephrotoxic substances produced marked increase in uric acid contents of the blood and deposition of crystalline urates in the body.

The presence of *E. coli* is of interest in view of the claims of Weisver.[3] However, the writer considers them to be of secondary importance.

Summary.—The occurrence in two widely separated flocks in West Pakistan of a hitherto unfamiliar disease in chickens with clinical, pathological, and hematological manifestations strikingly similar to avian monocytosis has been investigated. Efforts to transfer the disease often failed. Specimens often yielded cultures of *Escherichia coli* and micrococci.

References

[1]Quigley, G. D.: Is Blue Comb of Fowls Produced by Wheat? Poult. Sci., *22*, (1943): 267.

[2]Quigley, C. D.: The Effect of Wheat upon the Incidence of Pullet Disease or Blue Comb. Poult. Sci., *23*, (1944): 386.

[3]Biester, H. E., and Schwarte, L. H.: Diseases of Poultry. Iowa State College Press, Ames, Iowa, 1952.

Nitrofurazone Poisoning in Chicks

When 450 chicks, 1 day old, were given nitrofurazone in their feed at the rate of 0.04 to 0.07 per cent for three days (0.011 per cent is recommended as a coccidiosis prophylactic), 151 died and the survivors were retarded in growth. The affected chicks showed hyperexcitability, whirling in circles, and convulsive movements similar to a decapitated bird. No specific lesions were observed.—*Vet. Rec., July 2, 1955.*

Food Value of Killed *Bacterium Coli*

Cultures of *Bacterium coli*, when centrifuged, killed with heat, mixed with cereals, and fed to rats and chicks, proved to be equal to fish meal as a protein supplement. More than 600 animals were fed with no signs of toxicity, whereas alternate preparations containing the culture fluid were toxic. The growth promotion of the protein seemed greater than that of conventional animal proteins.—*Vet. Bull., June, 1955.*

Penicillinase-Producing Bacteria

Penicillin is ineffective against infection when penicillinase-producing bacteria such as *Staphylococcus aureus* are present. When 12-hour cultures of *Staph. aureus* were given subcutaneously to rabbits, there were no fatalities in the controls but 38 per cent died in the group treated with 30,000 units of penicillin daily. The survivors lost more weight than the untreated infected rabbits. —*Vet. Bull., May, 1955.*

The Warble Fly Problem

Research in Ireland indicated that the oral administration of three drugs to cattle, during the migratory period of the warble fly larvae, gave uniformly disappointing results. The drugs used were phenothiazine alone, phenothiazine plus hexachlorothane, and a third called "hypolin." In 1 animal, the larvae development was greater than in the controls.—*Irish Vet. J., June, 1955.*

Aureomycin and Rumen Organisms

Aureomycin® (40 to 60 mg.) was fed daily to 3 pairs of calves from 12 days of age until killed, with their control mates, at 5, 8, and 12 weeks of age, respectively. The aureomycin-fed calves had larger rumens with less acid contents and reached a rumen pH suitable for microorganisms at a much earlier age. Aureomycin seemed not to act directly on the rumen microorganisms.—*Vet. Bull., June, 1955.*

Intraperitoneal Sulfonamides

For use in laboratory animals, including reptiles, in which the intraperitoneal route is the most satisfactory method of sulfonamide therapy, the preparation of choice is sulfathiazole in a carboxymethyl cellulose, such as used for intramuscular penicillin suspensions. A simple suspension of the sulfonamide has usually been used since the sodium sulfonamide solutions are considered too alkaline for intraperitoneal use.—*Brit. M. J., May 28, 1955.*

Small Pigs and Atrophic Rhinitis.—The smaller pigs in a litter seemed more susceptible to infectious atrophic rhinitis than their larger litter mates.—*Canad. J. Agric. Sci., March-April, 1955.*

NUTRITION

Thiamine Deficiency in Sea Lions *(Otaria Californiana)* Fed Only Frozen Fish

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Galveston, Texas

A PARALYSIS resembling Wernicke's syndrome called Chastek paralysis has occurred in mink[1] and foxes[2] fed raw fish either fresh or frozen. This paralysis has responded to thiamine therapy.[3] Chicks fed a ration containing fresh fish developed a typical thiamine deficiency although the diet contained an adequate amount of vitamin B_1.[4] Spitzer *et al.*[5] have shown that carp tissues contain an enzyme-like substance that destroys thiamine. This observation has been confirmed by Woolley.[5] Deutsch and Ott[6] have shown that the degradation of thiamine by raw smelt leaves no thiazole or pyrimidine remainder, but raw carp has been shown[7] to contain two thiamine-destroying fractions which act, when combined, to produce 4-methyl-5-hydroxyethylthiazole and 2-methyl-4-amino-5-hydroxymethylpyrimidine from thiamine. This antithiamine factor in fresh and frozen fish is an enzyme which is destroyed by heat.[4]

METHODS AND MATERIALS

In 1947, a pair of young sea lions, purchased from the San Diego Zoo, were brought to Galveston, Texas, and kept in a large tank filled with water from the Gulf of Mexico. They appeared healthy and continued to grow until they weighed approximately 300 to 350 lb. The male was found dead approximately three years later (Nov. 24, 1950). A second male, purchased at that time, was found dead Feb. 11, 1952. The female continued to appear healthy and active until Oct. 20, 1954, when she, too, was found dead.

The sea lions were fed, daily, 5 lb. of frozen fish (whiting). Two capsules of cod liver oil (exact amount unobtainable) were inserted into a fish for each feeding of each lion. No other foods or vitamins were added to this ration.

The sea lions were necropsied six to eight hours following the time they were found dead. The tissues were fixed in a 4.0 per cent solution of formaldehyde. Paraffin sections were prepared and stained with hematoxylin and eosin. Sections of nerves from the first and third animals were studied with the following special techniques: osmic acid, Sudan IV, Sudan black, and the Marchi method.

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RESULTS

No significant pathological changes were observed in the first sea lion except in the nerves along the periphery of the esophagus and in the nerves over the pericardial sac. No other nerves in this sea lion were studied since a vitamin deficiency was not suspected at the time. Each section of nerve stained with osmic acid showed

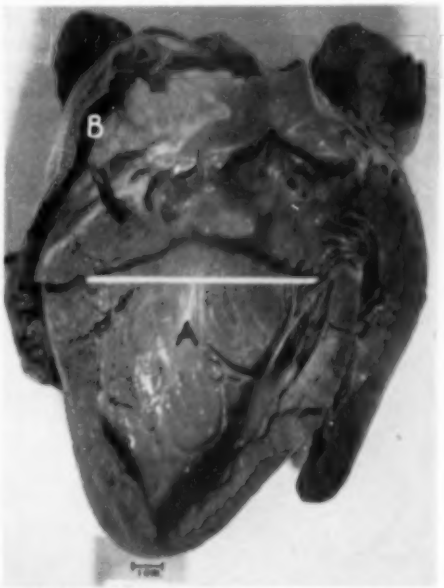

Fig. 1—The heart of the third sea lion to die showing the left ventricle (A) markedly dilated; the right ventricle (B) was also dilated but it does not show in this photograph. Dilatation of the heart such as this is a characteristic feature of thiamine deficiency in man (beriberi).

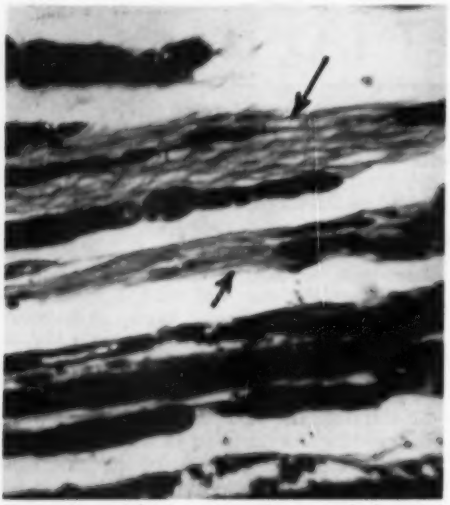

Fig. 2—Longitudinal section of nerve of the third sea lion to die. The normal myelin sheaths stain black. The degenerated areas of the nerve (arrows) show an absence of the myelin. Osmic acid stain; x 320.

focal areas in which the myelin was absent. The heart weighed 400 Gm. The cavities were not dilated. No significant histological changes were observed in the myocardium and no gross changes in the remaining viscera. There were no significant gross or microscopic lesions found in the second sea lion.

The heart in the third sea lion weighed 490 Gm. All cavities were markedly dilated (fig. 1). The myocardial fibers appeared to be separated, suggesting the presence of fluid. A large amount of blood-tinged fluid was present in each pleural cavity and an abnormally large amount in the pericardial cavity. The lungs were edematous. Several sections from the vagus nerve showed focal areas in which the myelin was completely absent when stained with osmic acid (fig. 2). In the Marchi stains, there were focal areas in which the myelin also stained black. Even in the section of nerves stained with hematoxylin and eosin, focal areas of degeneration could be seen (fig. 3).

The brain from the third sea lion weighed 390 Gm. No significant pathological changes were found. In the trigeminal nerve were focal areas of degeneration similiar to those previously described in other nerves in this animal.

DISCUSSION

Animals in captivity frequently develop thiamine deficiencies[8] but we know of no such reports for sea lions. The cardiac lesion in the third animal is consistent with thiamine deficiency as observed in man. Death apparently resulted from myocardial

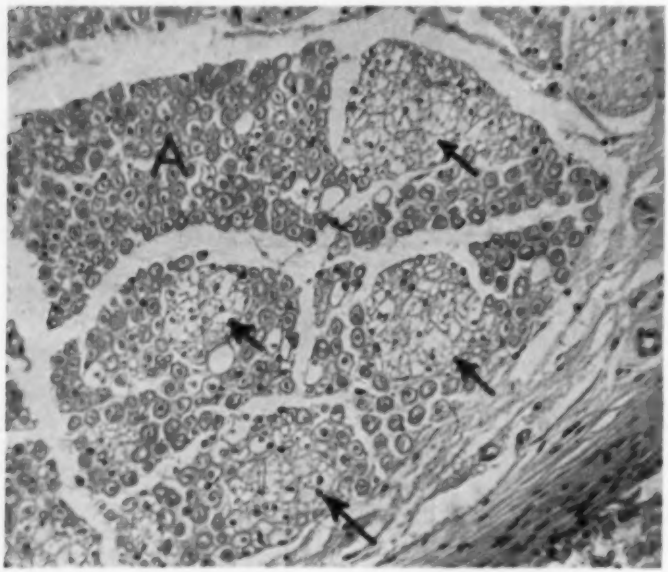

Fig. 3—Cross section of nerve of the third sea lion. Note the focal areas (arrows) in which the myelin sheaths are absent. The normal portion of this nerve is represented by area A. Hematoxylin and eosin stain; x 210.

failure. The degeneration of myelin sheaths in the nerves of 2 of the sea lions is consistent with a thiamine deficiency. No gross pathological changes which would suggest the cause of death were found in the first and second animals. In view of similar nerve lesions in 2 of these 3 animals, it would seem that each had a thiamine deficiency. None showed any clinical evidence of paralysis and each was considered, by the caretaker, to be perfectly normal on the day preceding death. The female survived for a longer period than the 2 males.

A thiamine deficiency could have been anticipated since the ration consisted only of fresh frozen fish which is known to contain an enzyme-like substance that destroys thiamine. It has been pointed out by Snow,[9] who has had considerable experience with sea lions in captivity, that vitamin B_1 should be added to their diet because of the presence of this destructive substance in certain fish. Furthermore, it has been observed by Snow[9] that "a shaking of the head, if pronounced, usually precedes death by about a week." This could be a clinical manifestation of a thiamine deficiency. It would be of interest to know if a thiamine deficiency ever occurs in sea lions in their native habitat, since fresh fish apparently is a primary source of food.

In the absence of other known agents and in view of experimental studies,[1,2] it would seem most likely that the demyelinization and the marked dilatation of the cavities of the heart in the third sea lion can be adequately explained by a thiamine deficiency.

SUMMARY

Three sea lions fed exclusively on fresh frozen fish died suddenly. Two showed degeneration in the nerves consistent with thiamine deficiency. One showed cardiac changes consistent with thiamine deficiency (beriberi) in man. Fresh frozen fish have been found by other investigators to contain an enzyme-like substance known to destroy thiamine.

References

[1]Alexander, L., Green, Robert G., Evans, C. A., and Wolf, Louis E.: Alcoholic Encephalopathy in Man and Fish-Diet-Disease in Foxes and Fishes. A Study in Comparative Neuropathology. Trans. Am. Neurol. A., 67, (1941): 119-122.

[2]Green, R. G., Carlson, W. E., and Evans, C. A.: A Deficiency Disease of Foxes Produced by Feeding Fish. J. Nutr., *21*, (1941): 245-256.

[3]Hodson, A. Z., and Smith, S. E.: Thiamine Deficiency and Chastek Paralysis in Foxes. Cornell Vet. *32*, (1942): 280-285.

[4]Spitzer, E. H., Coombes, A. I., Elvehjem, C. A., and Wisnicky, W.: Inactivation of Vitamin B_1 by Ray Fish. Proc. Soc. Exper. Biol. and Med., *48*, (1941): 376-379.

[5]Woolley, D. W.: Destruction of Thiamine by a Substance in Certain Fish. J. Biol. Chem., *141*, (1941): 997-998.

[6]Deutsch, H. F., and Ott, G. L.: Mechanism of Vitamin B_1 Destruction by a Factor in Raw Smelt. Proc. Soc. Exper. Biol. and Med., *51*, (1942): 119-122.

[7]Krampitz, L. O., and Woolley, D. W.: The Manner of Inactivation of Thiamine by Fish Tissue. J. Biol. Chem., *152*, (1944): 9-17.

[8]Steiner, Paul E., Rasmussen, T. B., and Fisher, L. E.: Neuropathy, Cardiopathy, Hemosiderosis and Testicular Atrophy in *Gorilla Gorilla*. Arch. Path., *59*, (1954): 5-25.

[9]Snow, Homer F., Oakland, Calif.: Personal communication, March 7, 1955.

Rumen Digestion

Ruminants differ from animals with simple stomachs primarily in their ability to digest large amounts of rough feed which has little value for other animals. However, they are not as efficient at converting energy and protein into edible products as are animals with simple stomachs. The rumen organisms can synthesize protein, all of the B vitamins, and certain fatty materials; therefore, ruminants can thrive on corncobs and other so-called waste materials which do not contain these substances, provided their ration is correctly supplemented.

The rumen bacteria need an available source of nitrogen which can be furnished either by proteins or by nonprotein nitrogen compounds, such as urea and ammonium salts. However, the nitrogen in ammoniated feeds has been found to be not readily available and urea, because of its extreme solubility, may prove toxic. Therefore, an inexpensive compound containing available nitrogen is being sought.

Energy for the rumen bacteria can be derived from cellulose but it is more efficiently utilized if some starch or soluble carbohydrates are also present. However, excessive amounts of sugar or of certain forms of starch greatly decrease the digestion of cellulose. For maximum cellulose breakdown, the bacteria need certain min-

eral elements, especially cobalt, sulfur, and phosphorus. In areas where these are deficient, they must be supplied.

Vitamin A is also necessary but a sufficient amount is usually present in good roughage. A small amount of alfalfa will supply not only the vitamins required but valuable minerals also.

Certain companies are exploiting the supplement field. Some of these make fantastic claims for disease-preventive potency of minerals and vitamins. Other special supplements, supposedly containing bacterial cultures which can stimulate rumen function, are being marketed without adequate evidence of real merit.—*Proc. Am. Feed Mfr. A., May 25, 1955.*

Effect of Cobalt on the Appetite

A cobalt deficiency was found to diminish the appetite of lambs and the resulting reduction in food intake caused physical wasting, the clinical sign of this deficiency. When a cobalt supplement was given, these animals increased in weight as a result of an improved appetite.—*Vet. Bull., May, 1955.*

U.S.D.A. Approves Stilbestrol Feeding.—In a test at Beltsville, Md., feeding 10 mg. per day of stilbestrol to 900-lb. steers increased their rate of gain by 6 per cent without affecting their meat quality. The carcasses graded the same as controls but contained slightly less fat. The flesh was equally firm and the water content the same as in the controls. Other tests are in progress.—*U.S.D.A., Sept. 21, 1955.*

Poultry Protein Pointers

If the proteins are properly balanced with fat, levels up to 32 per cent of the ration will produce increased gains in growing chicks. On 28 per cent protein, they averaged about 2 lb. each when 10 weeks old, but when 5 to 10 per cent of fat was added, their average weight was 2½ lb.

In another experiment, weight gain was doubled when a "growth factor" in fish by-products was added to a basal ration. The chicks in this experiment were from "depleted" hens which had received no animal protein or alfalfa meal from the time they were hatched. Chicks from hens that had received protein made a smaller response, indicating that this unknown growth factor had been transmitted from the hen to the chick.—*Univ. of Wisconsin Release, Aug. 11, 1955.*

Effect of Type of Ration on Butterfat

Experiments at the University of Reading, in England, show that as the roughage in a cow's ration is decreased and the nutrients replaced with concentrates, the butterfat level of the milk decreases. This may be the result of the suppression of rumen microorganisms which would decrease microbial rumen fermentation and lower the production of the short-chain fatty acids, the compounds which probably are the normal precursors for milk fat synthesis.—*Nutr. Rev., Sept., 1955.*

Sewage Sludge for Pigs and Chicks

Dry, activated sewage sludge is a potential source of vitamin B_{12}, a level of 2 per cent satisfying the B_{12} requirements for growth in baby pigs. Levels of 4 or 5 per cent were tolerated by pigs but levels of 6 to 10 per cent inhibited their growth and feed efficiency. With young chickens, levels from 2 to 10 per cent of the feed produced a growth increase of over 8 per cent compared to the basal group.—*J. Agric. and Food Chem., Sept., 1955.*

Cottonseed Meal Protein for Swine

Cottonseed meal with a high gossypol content was again shown to be harmful for swine, 0.04 per cent of gossypol being the highest safe level. When meal containing 0.024 per cent gossypol was used as the sole protein supplement, some pigs grew well, others poorly, and the unthrifty were affected with a mild dermatitis which disappeared when the pigs were placed on pasture. Growth was much more uniform when soybean meal was used alone as a supplement, but it improved when equal parts of low gossypol cottonseed meal and soybean meal were used.—*Florida Agric. Exper. Sta., Bull. 566, June, 1955.*

Adding surfactants to calf meal neither increased the growth rate nor affected the calf scours. Essentially the same results occurred when surfactants were fed to swine and poultry.—*J. Dai. Sci., April, 1955.*

EDITORIAL

The Placenta, What Is It?

Webster defines the mammalian placenta (*plakos*—anything flat and broad) as "the vascular structure by which the fetus is nourished in the uterus," consisting of "a modified part of the chorion. . .which develops villi that are received into the modified mucous membrane of the uterus"; also "constituting the chief part of the afterbirth."

Webster uses the accepted classification of mammals as "nondeciduate," with "chorionic villi . . . received into depressions in the uterine portion and withdrawn at parturition" and "deciduate," where the "relationship is so intimate that more or less of the uterine wall is torn off in parturition." It further classifies placentas as diffuse (mare, sow, camel), cotyledonary (most ruminants), zonary (carnivora), discoidal (rodents), and metadiscoidal (primates). However, Webster does not mention the maternal or the fetal placenta.

Definitions of the placenta given by medical dictionaries are of little value for veterinarians since they deal with the human type only.

Only the veterinary literature satisfactorily describes the placenta of domestic mammals. Williams ("Veterinary Obstetrics," 1940) states that "the placenta . . . comprises two newly formed structures—the one uterine or maternal and the other fetal." Dukes ("The Physiology of Domestic Animals") describes the fetal placenta as the portion(s) of the "outer layers of the fetal membrane [that] are in intimate relation with the endometrium," and the maternal placenta as the portion(s) of the "endometrium . . . modified to admit the attachment of the fetal placenta."

Until the seventh edition (1955), Dukes had classified mammals only as deciduate, including the zonary and the disklike (rabbit, monkey) types, or as indeciduate, including the diffuse and the cotyledonary or caruncular types. In the new edition, the discussion is revised so that it better "fits the usual zoological classification of mammals." Asdell, the author of this chapter, presents a new classification which includes the following five types:

1) epitheliochorial—in which six layers of tissue separate the fetal and maternal blood, namely, the fetal capillary endothelium, connective tissue, allantochorionic epithelium, uterine epithelium, connective tissue, and uterine capillary endothelium (horse, pigs);

2) syndesmochorial—with five layers of tissue, the uterine capillaries opening into spaces in the connective tissue (cow, sheep);

3) endotheliochorial—with four layers of tissue, the maternal connective tissue having disappeared (dog, cat, mink);

4) hemochorial—with no maternal barrier, therefore, only three layers of fetal tissue (man, monkey); and

5) hemoendothelial—with only one layer of tissue, the maternal blood surrounding the fetal capillaries (guinea pig, rat, rabbit).

When placental attachment first occurs in all mammals it is of the simplest type, but as pregnancy develops the barriers disappear until the final type for the species is reached.

Asdell suggests that the placenta has to be diffuse, when there are six layers of tissue for nutrients and waste materials to penetrate, because of the inefficiency of this type.

Why all this discussion of the placenta? Partly because it is, when present, one of the most interesting and important of the body organs; partly so all can profit from the revised classification presented by Dukes; and partly to throw a spotlight on an error, a partial one at least, in terminology which has become fairly well established in veterinary literature. We refer to the term "retained placenta."

Most practical persons favor brevity and rightly so, yet we must recognize accuracy and should utilize it in all formal expressions. To be accurate, should we not say "retained fetal membrane"? Even if all portions except the placenta were expelled, which would be quite a trick, the term "re-

tained placenta" would still be inadequate, because the maternal placenta normally remains in the uterus. Therefore, even in this hypothetical case, accuracy would demand the term "retained fetal placenta." "Retained afterbirth" would be more accurate, despite its possible midwifery connotation.

True, placenta sounds a bit more elite than fetal membrane but should "eliteness" have preference over accuracy?

Research Bulletins on Chinchillas Available

The National Chinchilla Breeders of America, Inc., announces the availability, on request from interested veterinarians, of research bulletins giving results of pure and applied researcch which NCBA is sponsoring at several educational institutions throughout the country. Requests to be placed on the mailing list for the bulletins should be addressed to Mrs. L. W. Griffith, editor, National Chinchilla Breeder, P. O. Box 2579, Salt Lake City, Utah.

Better Care for Monkeys

The tremendous increase in the demand for monkeys to produce Salk polio vaccine brought many less scrupulous dealers into the trapping and shipping business in India. The Indian government has agreed to license only reputable dealers and to police them. Agents now fly with the monkeys to provide constant care and, upon arrival, the animals are x-rayed, tested for tuberculosis, and treated for illness. Grants have been made for veterinary research on monkey diseases and for general care problems.—*Bull. M. Res., July, 1955.*

Feed Manufacturing in Ninth Place

The feed manufacturing business in 1954 was the ninth largest industry in the country. Prior to World War II, they produced 15 million tons a year but, aided by the government's protein allocation programs, production increased to 25 million tons by 1948.

It has continued to grow and 35 million tons were produced in 1954. Of this total, 61.5 per cent was poultry feed, 18.5 per cent was dairy feed, 10.2 per cent swine feed, and 5.3 per cent beef cattle and sheep feed, with 4.6 per cent miscellaneous feeds. In 1946, 20 per cent of all the feed consumed in the nation was manufactured; in 1954, it was 30 per cent. In New England, 90 per cent of all feed used is manufactured.—*The Feed Bag, April, 1955.*

Advice from Guernsey Breeders' Journal.—"Cow cleaning is not the job for the handyman . . . a veterinarian should attend the cow." The reasons for such advice are: the danger of infecting the cow or of being infected by brucellosis, leptospirosis, or other infections from the cow.—*Guernsey Breeders' J., Aug., 1955.*

Facilities for Poultry Disease Control.—In the United States, there are 93 laboratories, other than federal and commercial, in which poultry diagnostic work is done. Less than 20 per cent of these are staffed and equipped for special diagnosis of foreign or domestic poultry diseases that have unusual aspects. Plans for improving this situation are underway.—*U.S.D.A., July 29, 1955.*

"Mistakes I Have Made"

A column under this heading in *the Progressive Farmer* of July, 1955, states: "Failing to have our dog treated for rabies was our worst mistake. He was bitten by a stray dog . . . bit our oldest son and our cow. . . . We were left with a motherless calf . . . no milk for a family of seven. Three members of the family had to take twenty-one shots each. . . ."

Brucellosis in Denmark

In 1944, 25 per cent of all herds and 11 per cent of the total cattle population in Denmark showed infection with brucellosis. Since the Brucella ring test was adopted in 1946, and applied to all herds every three months, infection has dropped to about 1 per cent of the herds. Concurrently, brucellosis in man has dropped from 261 cases in 1944 to 33 cases in 1954.—*J.Am.M.A., Aug. 6, 1955.*

CURRENT LITERATURE

ABSTRACTS

Research on Foot-and-Mouth Disease

Surviving epithelium from tongues of cattle that were vaccinated against foot-and-mouth disease and from an animal that had recovered from the infection was used successfully in the tissue-culture titration method of Brooksby and Wardle. In comparative titrations in cattle and in tissue culture with four tissue-culture strains, two chick-propagated strains, and one egg-propagated strain, good correlation was observed. With one tissue-culture strain, modified Baker's solution instead of glucosol was used to obtain satisfactory results. Epithelium collected by the clamp method or Berkel machine method can be used in tissue culture. Virus-neutralizing antibodies produced in chickens and in cattle after infection with foot-and-mouth disease could be detected using the tissue-culture titration method.—[*James H. Gillespie and H. S. Frenkel: Research on Foot-and-Mouth Disease. VIII. Titration of Foot-and-Mouth Disease Virus, Making Use of Surviving Tongue Epithelium from Vaccinated Cattle. Am. J. Vet. Res., 16, (Oct., 1955): 505-510.*]

Neutralization of Bovine Papilloma Virus

The neutralizing ability of serums from horses and cattle artificially infected with bovine papilloma material were tested. The serum-virus mixtures were then inoculated into the skin of susceptible horses to measure activity. The incubation period and size of growth in the horse was directly related to the size of infective dose.

Cattle with papillomas do not have neutralizing antibodies in their serums. Horses with growths caused by the agent of bovine papilloma do have neutralizing antibodies in their serum.

Horses vary in their susceptibility to bovine papilloma. A heat-labile neutralizing factor was found in the blood serum of a comparatively resistant horse.

A strain of bovine papilloma virus with low virulence for cattle was highly infective for the horse. Another strain with high virulence for cattle was of low infectivity for the horse.—[*D. Segre, C. Olson, Jr., and A. B. Hoerlein: Neutralization of Bovine Papilloma Virus with Serums from Cattle and Horses with Experimental Papillomas. Am. J. Vet. Res., 16, (Oct., 1955): 517-520.*]

Antihemolytic Micrococcus

A nonhemolytic Micrococcus is reported that elaborates a substance which is capable of preventing the lysis of erythrocytes which are first treated with the inhibitory substance and then exposed to various hemolytic toxins. The Micrococcus which elaborates this substance was isolated from a milk sample collected aseptically from a bovine mammary gland. The inhibitory substance is heat labile and its antihemolytic effect is apparently from action on the red cell membrane rather than from an inactivation of the hemolytic toxin.—[*A. C. Pier: A Strain of Micrococcus Exhibiting Antihemolytic Properties. Am. J. Vet. Res., 16, (Oct., 1955): 605-607.*]

Preservation of Leptospira by Freezing

Viability of *Leptospira icterohaemorrhagiae* grown in Korthoff's medium, concentrated by centrifugation, suspended in various colloidal substances, and stored at subzero temperatures has been demonstrated for periods up to one year. Leptospiras survived for at least eight months when suspended in skim milk or in normal horse serum and stored in a dry ice chest. When suspended in 1 per cent starch, 3 per cent gelatin, 2 per cent casein, and skim milk and stored at −27 C., viability has been demonstrated for nine to 12 months. When suspended in 3 per cent gelatin, 1 and 2 per cent casein, skim milk, normal horse serum, and egg yolk and stored at a temperature of −47 C., survival has been demonstrated for one year.—[*John M. Shigekawa and Jack J. Stockton: Studies on the Preservation of Leptospira Icterohaemorrhagiae by Freezing. Am. J. Vet. Res., 16, (Oct., 1955): 619-622.*]

Studies on Pseudomonas Mastitis

The Pseudomonas organisms found in bovine mastitis may be classified as Pseudomonas without the presence of green pigment. Blood and milk serum-agglutination titers may be an aid to bacterial culturings, to indicate the presence of Pseudomonas infection. Milk from cows with mastitis is the medium of choice for antibiotic-sensitivity testing.—[*M. J. Deubler and E. J. Cole: Preliminary Studies on Pseudomonas Mastitis. Am. J. Vet. Res., 16, (Oct., 1955): 511-514.*]

Phenothiazine-Salt Mixture for Lambs

The continued use of free-choice medication with phenothiazine and salt during successive grazing seasons has been shown to be advantageous in controlling combined natural Haemonchus and Nematodirus infections in lambs. Medicated lambs, as compared with nonmedicated controls, showed lower egg counts, fewer total worms, greater gains, better condition, and higher blood levels during the two trials. The lambs benefited more from the medication than comparable lambs of the previous season, indicating that the regimen achieves progressive decontamination of pastures in successive

seasons. All treated lambs survived the exposure, whereas 5 of 8 untreated lambs succumbed during the two trials. Comparable lambs, unexposed to gross parasitism and untreated, made the best gains during the two successive years.—[*M. L. Colglazier and J. H. Turner: An Experiment on the Cumulative Efficacy of Phenothiazine-Salt Mixture Against Nematodirus and Haemonchus in Lambs During a Second Grazing Season. Am. J. Vet. Res., 16, (Oct., 1955): 558-562.*]

Effect of Phenothiazine on Conception in Sheep

Forty-eight ewes were each given one full therapeutic dose (25 Gm.) of phenothiazine one day before the breeding season started; 48 other ewes from the same source served as untreated controls. Observations were made concerning occurrence of estrus, conceptions to first service, total pregnancies during the breeding season, and incidence of twinning. Pregnancies were determined by examination of the uteri when the embryos were approximately 25 days of age. There was no evidence that the phenothiazine treatment had detrimental effects in any of the aforementioned aspects of reproduction. —[*R. L. Blackwell and Rex W. Allen: Effect of Phenothiazine on Conception Rate in Sheep. Am. J. Vet. Res., 16, (Oct., 1955): 563-564.*]

Transmissible Gastroenteritis in Pigs

Disease-free, antibody-devoid young pigs obtained by hysterectomy and raised in isolation were used in the study of transmissible gastroenteritis (TGE). Some characteristics of the infectious agent and the disease as determined in these studies follow.

The infective TGE agent passed a 230-mμ gradocol membrane but not a 170-mμ membrane. Its particle size was estimated at 200 mμ.

Five-day-old pigs were refractory to large doses of the TGE agent on intratracheal instillation and intraperitoneal injection. They were readily susceptible to the virus on intranasal and intragastric instillation.

Although the TGE agent did not ordinarily multiply in lung tissue of 6-day-old pigs following intranasal instillation, it multiplied readily in the lungs of pigs inoculated when 2 hours old. The opposite occurred in the nasal mucosa, the virus multiplying readily in 6-day-old pigs, but not in 2-hour-old pigs. The agent multiplied readily in all portions of the gastrointestinal tract. Viremia 48 or more hours after inoculation was common. A maturation resistance to TGE occurred in pigs with advancing age. Mortality approached 100 per cent in pigs less than a week old.

Obvious infections occurred in 11- and 17-day-old pigs but the mortality was low. In 24-day-old pigs, TGE infection occurred but was inapparent.

Specific anti-TGE serum was produced in 16-week-old pigs. It contained sufficient antibody to neutralize TGE virus *in vitro* and to protect the life of pigs *in vivo*.—[*George A. Young, Ronald W. Hinz, and Norman R. Underdahl: Some Characteristics of Transmissible Gastroenteritis (TGE) in Disease-Free, Antibody-Devoid Pigs. Am. J. Vet. Res., 16, (Oct., 1955): 529-535.*]

Studies on Infectious Atrophic Rhinitis

A pleuropneumonia-like organism from swine is discussed. Its natural habitat appears to be the nasal cavities of swine. This organism was found in 64 (66.7%) of 96 swine specimens with gross turbinate atrophy and in 52 (67.8%) of 90 swine specimens with no gross turbinate atrophy. This organism can be cultivated in both chicken embryos and artificial medium. The morphology, staining reactions, biochemical reactions, and storage of this pleuropneumonia-like organism are considered. When it is inoculated intraperitoneally into pigs 6 weeks or less of age, it produces severe fibrinous pericarditis, moderate fibrinous pleuritis, and mild peritonitis. From 5 to 20 per cent of the inoculated pigs may develop arthritis. Similar lesions produced by this organism occur in swine under field conditions. This organism does not appear to cause turbinate atrophy. The name *Mycoplasma hyorhinis* (n. sp.) is proposed for this organism.—[*William P. Switzer: Studies on Infectious Atrophic Rhinitis. IV. Characterization of a Pleuropneumonia-like Organism Isolated from the Nasal Cavities of Swine. Am. J. Vet. Res., 16, (Oct., 1955): 540-544.*]

Streptomycin and Infectious Coryza of Chickens

In vitro bacteriostatic and bactericidal titers of streptomycin against 24 and 19 strains, respectively, of *Hemophilus gallinarum* are presented. Comparison with previously reported blood concentrations indicates that intramuscular injection of 0.2 Gm. of streptomycin per chicken is adequate for a bactericidal effect against most strains. These *in vitro* titrations are confirmed by *in vivo* experiments which proved sterilization of the pathogen within two hours by this dose. A lower dosage is inadequate and is liable to develop streptomycin-resistant strains even after one injection.—[*S. Bornstein and Y. Samberg: The Therapeutic Effect of Streptomycin on Infectious Coryza of Chickens Caused by Hemophilus Gallinarum. III. In Vitro and in Vivo Sensitivity of Hemophilus Gallinarum to Streptomycin. Am. J. Vet. Res., 16, (April, 1955): 321-324.*]

Hemolytic Activity of Newcastle Disease Virus

All strains of Newcastle disease virus (NDV) and the one strain of mumps virus employed hemolyzed chicken red blood cells at 37 C. Dialyzed allantoic fluid viruses which had been frozen and thawed were highly hemolytic when compared with untreated allantoic fluid viruses, frozen and thawed allantoic fluid viruses, and dialyzed allantoic fluid

viruses. This activity was highly heat labile and was progressively inactivated by 0.1 per cent formalin but was relatively stable at refrigerator and freezing temperatures. Calcium was somewhat inhibitory to the reaction; whereas, specific antiserum completely inhibited hemolysis. The possibility of a receptor gradient among mumps virus and strains of NDV was observed. The degree of hemolysis produced by these viruses could not be correlated with other of their known properties such as pathogenicity and heat stability of the hemagglutinative activity.—[*W. H. McCallum and C. A. Brandly: Hemolytic Activity of Newcastle Disease Virus. Am. J. Vet. Res., 16, (Oct., 1955):* 584-592.]

pH Values and Enzymatic Activity of the Digestive Tract of the Chicken

Extracts were made from the alimentary tract of 30 chickens; 15 were prepared in glycerol and 15 in water. Some protein and carbohydrate digestion occurred in the crop. Peptic activity was noticed in the gizzard. The largest amount of enzymatic activity was exhibited in the intestine. Proteolytic, amylolytic, and lipolytic activity were observed in the intestine. Carbohydrate-splitting enzymes were found in the bile.—[*E. A. Hewitt and R. L. Schelkopf: pH Values and Enzymatic Activity of the Digestive Tract of the Chicken. Am. J. Vet. Res., 16, (Oct., 1955):* 576-579.]

Xanthomatosis in Chickens

A condition reported to be xanthomatosis in chickens is described. Affected birds showed swollen wattles and swellings on other parts of the body. Histological examination of the affected tissues showed foam cells, connective tissue, and lenticular spaces.

Attempts to correlate this condition with abnormal blood components were unsuccessful. The etiology of this condition was undetermined.—[*M. C. Peckham: Xanthomatosis in Chickens. Am. J. Vet. Res., 16, (Oct., 1955):* 580-583.]

Pasteurella in Chronic Fowl Cholera

In the course of bacteriological examination of flocks of chickens suffering from chronic fowl cholera, an atypical Pasteurella organism was isolated repeatedly from the upper respiratory tract of approximately 50 per cent of the birds cultured. This atypical Pasteurella is a bipolar, gram-negative, nonmotile microorganism. It does not produce indol, is nonhemolytic, and is low in virulence. It can also be isolated from chickens affected with other maladies characterized by inflammation of the upper respiratory tract. We have been unable to isolate this organism from healthy fowl. Of 386 large animals cultured from the upper respiratory tract, only three cultures of the new species of Pasteurella have been isolated—two from cattle and one from a sheep. This newly described microorganism resembles the Pasteurella but differs biochemically, serologically, and in growth characteristics from the other members of this genus commonly found in poultry and livestock, *Pasteurella multocida* and *Pasteurella hemolytica*, and it is most frequently isolated from poultry. Our suggestion, therefore, is that it be designated as a new species of Pasteurella, and that it be named *Pasteurella gallinarum*.—[*W. J. Hall, K. L. Heddleston, D. H. Legenhausen, and R. W. Hughes: Studies on Pasteurellosis. I. A New Species of Pasteurella Encountered in Chronic Fowl Cholera. Am. J. Vet. Res., 16, (Oct., 1955):* 598-604.]

Vaccination for Avian Encephalomyelitis

During an outbreak of avian encephalomyelitis (AE) in 1949-1950, high mortality rates characterized only the progeny of the youngest generation of breeding hens. This suggested that the older hens had developed immunity to it and, therefore, were incapable of transmitting AE through their eggs to the chicks.

Since that time, there has been no serious recurrence of the disease among chicks under conditions where: (1) the survivors of the 1949-1950 outbreak of AE have been retained as breeders; (2) the live virus of AE has been systematically distributed to young chickens before they reach maturity; and (3) the disease is known to be present in active form.

In two experiments, chicks inoculated in the wing web with 25 chicken lethal dose$_{50}$ (c.l.d.) quantities of AE virus later suffered less than half the mortality of controls following intracerebral challenge with 250 c.l.d.$_{50}$ of the virus.

These results indicate that AE can be satisfactorily controlled by the exposure of immature chickens to the live virus, enabling them to develop immunity before their eggs are used for hatching.—[*Kermit Schaaf and W. F. Lamoreux: Control of Avian Encephalomyelitis by Vaccination. Am. J. Vet. Res., 16, (Oct., 1955):* 627-633.]

FOREIGN ABSTRACTS

Bacteriostatic and Bactericidal Activity of Sulfonamides

In a study of sulfachiazole, sulfamethazine, sulfadiazine, and marfanil, sulfathiazole was found to be superior to the other drugs against all the organisms studied.—[*A. C. Martinez: Comparative Bacteriostatic and Bactericidal Activity of Several Sulfonamides Against Staphylococci, E. Coli, Pneumococci, Salmonella, and Pasteurella. Vet. Tec. Espanola, 1, (1953):* 3-13.]—G.T.E.

Treatment of Demodex Canis Infection

The authors suggest that most clinicians are convinced that demodectic mange in dogs is incurable. They report their results on 25 dogs after diagnosis was established by microscopic examination of skin scrapings and the animals were

treated by injecting 0.5 to 1.0 cc. of trypan blue, 1 per cent in saline solution, per kilogram of body weight. The interval between injections was three to six days. Of the 25 dogs, 19 showed marked improvement. Some agent was then applied topically to hasten growth of hair and recovery of the skin.—[*M. P. Garinov and A. E. Dulebov: Demodex Canis Infection and Treatment. Rev. Med. vet., 7, (1954): 102.*]—G.T.E.

Electron Microscopic Studies of Negri Bodies

Studies were made of electron photomicrographs of sections cut through the Negri body-containing cells of the hippocampi of mice dead with street rabies after fixation in neutral osmium tetraoxide. Neither the Negri bodies themselves nor other components of the cells in these preparations have revealed the presence of uniform particles that could be identified as units of the rabies virus. The Negri bodies have a fine structure which could be interpreted as that of an emulsion of electron-optically dense matter within the cytoplasm of the affected cells.—[*O. Croissant, P. Lepine, and R. W. G. Wyckoff: Recherches sur L'ultrastructure Deicorps de Negri Examines au Microscope Electronique. Ann. Inst. Pasteur, 89, (Aug., 1955): 183-193.*]—R.F.V.

Torsion of the Canine Stomach

Seven cases of acute torsion of the stomach of the dog have been described. One of them was corrected by surgery. The history and clinical symptoms were typical. When indicated, the operation should be performed without delay. Etiologically, the torsion of the stomach of dogs is considered to be a result of a constitutional weakness of the stomach's suspension. Size of the animal and the shape of the thorax are predisposing factors.—[*H. Stunzi, E. Teuscher, and M. Scheitlin: Pathology and Therapy of Acute Torsion of the Stomach of Dogs. Schweiz. Arch. f. Tierheilk, 97, (1955): 312-317.*]—F.K.

Ear Trimming in Dogs

The author describes his technique in ear trimming for which he has developed a new instrument, a chondrotome, a wide chisel-like implement. He finds this superior to clamps, scissors, or other conventional instruments employed. He has been able to reduce the time required to complete the operation and the end results are much more pleasing.—[*A. Lebeau: Chondrectomie Chez le Chie. Bull. Acad. Vet., 33, (May, 1955): 200-202.*]—R.F.V.

Experimental Leptospirosis in Guinea Pigs

Leptospira icterohaemorrhagiae, on subcutaneous inoculation, caused death in susceptible guinea pigs in six days, with signs and lesions of leptospirosis as well as the recovery of a large number of Leptospira. The 24 guinea pigs, averaging 150 Gm., were inoculated subcutaneously with 0.1 cc. of material.

When the antibiotic, synnematin B, was administered subcutaneously at a dosage of 40 to 80 mg. each three to twelve hours, it had therapeutic value when given within 24 hours after infection.—[*G. Varela, et al.: Action of Synnematin on Experimental Infections in Guinea Pigs Caused by Leptospira Icterohemorrhagiae. Rev. Inst. de Salubr. y Enferm. Trop., 14, (1954): 215.*]—G.T.E.

Nitrogen Metabolism in the Rumen

The authors describe the type of ciliate, flagellate, rhizopod, and other protozoa present in the rumen and how these, plus the bacteria, form an important source of nitrogen for ruminant metabolism.

Temperature, pH, anaerobiosis, and trace minerals are important to bacterial metabolism and cellulolytic action on the food particles.

Proper utilization of urea as a source of nitrogen is believed to be dependent on an adequate supply of carbohydrates for the activity of these bacteria.—[*A. de Vuyst and M. Voubelle: Nitrogen Metabolism in the Rumen. Zootechnia, 4, (1955): 5.*]—G.T.E.

BOOKS AND REPORTS

The Physiology of Domestic Animals

This textbook, originally written in 1933 for student use, has been expanded with each edition until it has become a must for all who are active in the profession. Extensive revisions have been made since the sixth edition (1947) on such subjects as blood and hematological data; electrocardiography; blood pressure; ruminant stomach; renal clearance; neurohormonal transmission; and many others.

New features include a chapter on "Water, Electrolytes, and Acid-Base Balance" and an expansion of the part on "Intermediary Metabolism." The number of illustrations has been increased from 184 to 238; the number of pages from 817 to 1,020.

It is impossible to adequately review such a comprehensive text. However, it is difficult to imagine anyone with an interest in animal life who would not profit from studying it. Few finer texts on any veterinary subject are available.—[*The Physiology of Domestic Animals. By H. H. Dukes. 7th ed. 1,020 pages. Illustrated. Cornell University Press, 124 Roberts Place, Ithaca, N.Y. 1955. Price $9.75.*]—W.A.A.

Anatomy of Domestic Animals

The first volume of this textbook describes the bones and the muscles of horses, cattle, swine, and dogs. With regard to the size (173 pages) the description is, of course, relatively superficial and can not be compared with other classical books of anatomy of the domestic animals.

Also, the pictures, always important in any book of anatomy, are in this publication just simple

drawings, some of which do not reach the high level of pictures in other known textbooks of anatomy.

The important chapter pertaining to kinetics (static and dynamic) has been discussed in a limited way so that it is hardly believed to be sufficient.—[*Textbook of Comparative Anatomy of the Domestic Animals (Lehrbuch der vergleichenden Anatomie der Haustiere). By J. Dobberstein and T. Koch. 173 pages, 186 illustrations. S. Hirzel Verlag, Leipzig, Germany. 1955. Price not given.*]—FRANK KRAL.

The United States Pharmacopeia

This is the fifteenth edition of the original "Pharmacopeia of 1820," now revised at five-year intervals. Its objective from the first has been to "select from among substances which possess medicinal power, those . . . most fully established . . ." and to distinguish them "by convenient and definite names . . . to prevent . . . uncertainty in the intercourse of physicians and apothecaries."

This 1,230-page edition has 838 monographs. Of these, 242 are new while 160 have been deleted from the previous (1947) edition (1,067 pages).—[*The United States Pharmacopeia. By Authority of the U.S. Pharmacopeial Convention, Inc. Mack Publishing Co., Easton, Pa. 1955 Price — $10.00, Domestic; $10.50, Foreign.*]—*W.A.A.*

Introduction to Bacterial Physiology

This 400-page text is designed for a course at the undergraduate level. Its purpose is to bridge the gap between general bacteriology and graduate studies in bacterial physiology. This is a growing field since the importance of a bacterium, be it in dairy industry, in soil fertility, or in production of disease, is based solely on its physiological properties.

The text contains 19 chapters, ranging from cytology, genetics, and metabolism to adaptation, mechanisms of survival, and virulence as a physiological problem.

The text is well written and should interest many veterinarians.—[*An Introduction to Bacterial Physiology. By Evelyn L. Oginsky and Wayne W. Umbreit. 400 pages. Illustrated. W. H. Freeman and Co., San Francisco, Calif. 1954. Price—Text $6.00, Trade $7.25.*]—W.A.A.

A Manual of Medical Virology

This loose-leaf, 127-page volume, designed for students, is not a complete work on medical virology but it is a supplementary outline, designed for use in a limited course in that subject. Discussions, therefore, are brief and, in places, admittedly superficial. While it does not deal with all rickettsial and viral diseases of interest to veterinarians, they are listed in a classification in an appendix. Of those included, it briefly discusses the clinical, diagnostic, immunity, and control features but not the pathology. Its value to veterinarians is limited.—[*A Manual of Medical Virology. By S. S. Kalter and J. E. Prier. Burgess Publishing Co., 426 S. Sixth St., Minneapolis 15, Minn. 1955. Price $3.50.*]—W.A.A.

Laboratory Manual for Histology

This manual should prove valuable to teachers of histology and embryology who have not heretofore used a guide or who have not as yet prepared one. Slides are referred to in terms of representative tissues and organs, not to specific structures, so that the guide can be adapted to a standard set of slides.

Much of the material is presented in the form of thought-provoking questions. Species differences in domestic animals are not emphasized. Very little of the textbook type of information is given. The questions, however, are designed to insure that the student has made complete and accurate observations of the slides.—[*Laboratory Manual of Histology. By J. F. Smithcors. 101 pages. Burgess Publishing Co., 426 S. Sixth St., Minneapolis 15, Minn. 1954. Price $2.00.*]—L. E. ST. CLAIR.

Clinical Handbook of Veterinary Medicine

This pocket-sized, loose-leaf, leather-backed handbook was compiled by members of the class of 1956, School of Veterinary Medicine, University of Pennsylvania, from class material, for the benefit of students in the clinic. It will also be of value when they become practitioners. The material is presented under such headings as: biologicals, clinical tests, dermatology, drugs, insecticides, hormones and vitamins, physiology, podology, prescriptions, radiology, and toxicology.

While admittedly not complete, and sometimes inadequate, it is an interesting compilation.—[*Clinical Handbook of Veterinary Medicine. By the Class of 1956, School of Veterinary Medicine, University of Pennsylvania. Fred D. Griffiths, East Lansdowne, Pa., 1955. Price not given.*]—W.A.A.

A Dictionary of Terms in Pharmacognosy

This is the first edition of a compilation of words and expressions related principally to natural medicinal and pharmaceutical materials, and the plants and animals from which they are derived. It gives the chemical composition, applications, and uses of many of these products. There is, so far as can be determined, no comparable work. It should be a practical aid to all those in research or teaching in the various medical fields, and especially to pharmacologists.—[*A Dictionary of Terms in Pharmacognosy and Economic Botany. By George MacDonald Hocking. 284 pages. Charles C. Thomas, 301-237 East Lawrence Ave., Springfield, Ill. 1955. Price $9.75.*]—W.A.A.

THE NEWS

American Public Health Association to Meet in November

The American Public Health Association will hold its third annual meeting at the Municipal Auditorium, Kansas City, Mo., Nov. 14-18, 1955. Veterinarians on the program and their subjects include **Lt. Col. K. F. Burns,** Fort Sam Houston, Texas (bat rabies); **Dr. A. H. Quin,** Kansas City (Our Professional Heritage); **Dr. Oscar Sussman,** Princeton, N. J. (psittacosis in turkeys and man); **Dr. James H. Steele,** Atlanta, Ga. (zoonoses); **Major Robert A. Juni,** Eglin Air Force Base, Fla. (military public health); and **Dr. R. J. Helvig,** Washington, D. C. (new poultry ordinance).

Veterinarians on Milk Sanitation Program

Among those on the program of the forty-second annual meeting of the International Association of Milk and Food Sanitarians held in Augusta, Ga., Oct. 2-6, 1955, were **Dr. R. J. Helvig,** U. S. Public Health Service, Washington, D. C., who reported on "Communicable Diseases Affecting Man"; **Dr. G. R. Spencer,** Department of Veterinary Medicine, Washington State College, Pullman, who gave a paper on "Efficacy of Disinfectants for Decontamination of Teat Cups"; and **Dr. Ernest Tierkel,** U. S. Public Health Service, Atlanta, Ga., who discussed "Wildlife Rabies at Home and Abroad."

Meeting of New England Association

The twenty-first annual conference of the New England Veterinary Medical Association was held at the Poland Spring Hotel in Poland Spring, Maine, on Oct. 2-5, 1955.

The scientific program included the following speakers and their subjects: **Drs. James Muffley,** Lewisburg, Pa. (nonsurgical removal of foreign bodies from the bovine rumen); **Wade Brinker,** East Lansing, Mich. (surgery of coxofemoral joint); **L. M. Hutchings,** Lafayette, Ind. (swine diseases); **Jean Holzworth,** Boston, Mass. (infectious diseases of cats); **Forest Tenney,** Peterborough, N. H. (ovine obstetrics and diseases of newborn lambs); **C. A. V. Barker,** Guelph, Ont. (genital surgery for infertility in cattle); **Floyd Cross,** Fort Collins, Colo., president of the AVMA (Association activities); **A. H. Craige,** Indianapolis, Ind. (sex hormones in veterinary practice);

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A Visit to the Kogashima Veterinary College in Japan

Major W. J. Morley, V.C., U.S. Army (center), interviewing Dean Niimi (second from left) and heads of departments at the Kogashima Veterinary College, Kyushu, Japan, for the Council on Education of the AVMA. To obtain information on which to base a rating, Colonel William Jennings, chairman of the committee on foreign veterinary schools, frequently calls on personnel of the Veterinary Corps.

This school has five departments, a faculty of 12, and the course consists of one and one-half years of "pre-vet" study and two and one-half years of veterinary medicine. (Submitted by L. H. Geisinger.)

News From Washington

The U.S.D.A., on October 5, announced **it is sponsoring a nationwide, uniform plan for identifying dairy and beef cattle with one eartag for each animal.** Under the new system, using a combination of letters and numbers, more than **8 billion** cattle could be tagged without a single duplication. The U.S.D.A. stated that the most important feature of the new system is a single "book" (record of numbers) kept in each state. Official agencies and groups buy the identification tags where they choose, but first must obtain a block assignment of numbers from the federal or state official responsible for keeping the book within the state. Central offices will be designated for this purpose. Agencies or groups reserving a large block of numbers from the central state official will then be responsible for making and recording assignments of sequences of the numbers to their various members. The complete series of eartag numbers in a single state runs, for example, from 35-AAA0001 through 35-ZZZ9999 (the number "35" is the code for Wisconsin). It was stated the block of numbers for each state is sufficient for all the different agricultural groups concerned with dairy herd improvement, artificial breeding, and disease eradication. Animal disease eradication workers expect that use of the system will remove one of the chief difficulties in tracing cases of bovine tuberculosis to their point of origin. ARS is now contracting for eartags conforming with the uniform plan for use in identifying animals in the brucellosis and tuberculosis eradication programs. The main advantages of the new plan: (1) no duplication of identification numbers; (2) only one tag per animal; (3) no additional cost to individuals or groups.

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The Advisory Group appointed to review **the brucellosis eradication program** (see JOURNAL, September, 1955:277) held its first meeting in Washington, September 8 and 9. The group was briefed on the status of the program by Dr. B. T. Shaw, administrator of ARS, and by members of his staff, including Dr. M. R. Clarkson, deputy administrator for regulatory programs; Dr. B. T. Simms, director, Livestock Research; and Dr. R. J. Anderson, chief, Animal Disease Eradication Branch, ARS. Dr. Shaw, during his remarks, pointed out the program was cooperative with the states, and that eradication operations varied somewhat from state to state, depending on local needs and conditions. He emphasized the Department's desire to obtain from the group a frank appraisal of the eradication program and, particularly, whether adequate results were being obtained for the money being spent. The chairman, Dr. W. A. Hagan, stated that livestock organizations and other interested groups would be asked for their views regarding the brucellosis program, to aid the consultants in their task of evaluation.

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The Internal Revenue Bureau, in a series of rulings, has summarized **deductible and nondeductible medical expenses for income tax purposes.** The rulings combine new interpretations with a clarification of old rulings. Some examples are: Travel expenses are deductible where daily visits to a medical clinic are required, but (since 1954) cost of food and lodging are not, except as part of a hospital bill. **Special** instruction in speech and lip reading for a deaf child is a deductible expense, but **not** a course of ordinary instruction. If a health and accident indemnity insurance policy covers both accident indemnity and medical expense reimbursement, premium cost for the latter is deductible but **not** for the former.

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Washington 5, D. C.

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Edgar M. Tucker, Concord, Mass. (mastitis control); **David Coffin** and **Todd Munson**, Boston, Mass. (clinico-pathological conference); **Francis J. Mulhern**, ARS, U. S. Department of Agriculture, Washington, D. C. (emergency disease eradication); **William G. Magrane**, Mishawaka, Ind. (ennucleation); **S. W. Stiles**, Portland, Maine (chairman, question box).

Social activities included golf, tennis, swimming, dancing, hiking, and fishing.

s/C. LAWRENCE BLAKELY, *Secretary.*

International Congress on Animal Reproduction

The Third International Congress on Animal Reproduction will be held at Cambridge, England, on June 25-30, 1956, with Sir Thomas Dalling presiding. The subjects to be covered include physiology, pathology, and artificial insemination.

International Congress of Entomology in Montreal in 1956

The Tenth International Congress of Entomology will be held in Montreal, Aug. 17-25, 1956. Interested persons should communicate with the secretary, Mr. J. A. Downes, Division of Entomology, Science Service Building, Ottawa, Ont.

The provisional sections of the Congress now number 15, including one on medical and veterinary entomology.

STUDENT CHAPTER ACTIVITIES

For copy deadline, see "Among the States and Provinces"

Iowa Chapter.—The Iowa State College Student Chapter of the AVMA held its annual homecoming banquet for alumni on October 22. This was the seventh annual reunion and was held in connection with the Iowa-Kansas football game.

The following officers will serve the Chapter during the current school year: Robert Sharp, president; Tom Spencer, president-elect; Frances Copeland, secretary; Don Allgood, treasurer; Bill Carberry, critic; and Dr. William Monlux, faculty advsior.

s/RICHARD HOUCK, *Retiring secretary.*

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Kansas Chapter.—William G. Kvasnicka, senior in veterinary medicine, was awarded the $100 M. Franklin scholarship for the 1955-1956 school year. The scholarship is awarded each fall to a senior veterinary student on the basis of demonstrated worthiness and leadership potential, scholastic achievement, and need. Funds for the award were established by Dr. O. M. Franklin, a former Kansas State staff member and manufacturer of biological products. Mr. Kvasnicka has served as president of the Kansas State Student Chapter of the AVMA.

WOMEN'S AUXILIARY

Convention Highlights.—Didn't you have a wonderful time at the Ninety-Second AVMA Annual Convention held in Minneapolis, Minn., Aug. 15-18, 1955? Or were you among those missing? If for any reason you were unable to attend, may I share with you some of the highlights and then you may resolve here and now to be sure you don't miss the meeting next year in San Antonio, Texas.

Since 1934, I have been attending AVMA conventions intermittently. In my opinion, the meeting just held in Minneapolis was one of the best. I shall long remember the sincere friendliness, cordial hospitality, and outstanding courtesy of the Minnesota women. Mrs. R. A. Merrill, general chairman, and her committee deserve a gold medal.

Mrs. L. R. Richardson, president, represented the Women's Auxiliary at the Opening Session of the AVMA and we were all proud of her and the greetings she extended from all of us.

On Monday afternoon, a delightful tea and reception was held at the Curtis Hotel with a record number of women attending.

On Tuesday morning, the House of Representatives of the Auxiliary met at 9:00 o'clock. There were 53 delegates seated, representing states, regions, and provinces. There was also a fine attendance of interested auxiliary members. Mrs. Earl N. Moore, then president-elect, presided. Some of the business voted upon was the adoption of the 1955-1956 budget of $4,200. Since the membership of the Auxiliary has increased and is now over 4,500, it was voted to increase the dues from $1 to $2 a year. The delegates also voted to grant a six months' paid membership to all wives of graduating seniors.

Mrs. A. E. Bott, Bellville, Ill., honorary president of the International Women's Auxiliary to the Veterinary Profession, introduced Mrs. Julio San Miguel from the Women's Auxiliary in Santiago, Chile, who brought greetings from her group. After listening to Mrs. San Miguel, we surely felt a closer kinship with our neighbors to the south. Mrs. E. L. Brown from Saskatchewan, Canada, also brought greetings from our friends to the north.

The annual luncheon was an outstanding affair. It was held in the Grand Ballroom of the Radisson Hotel and over 1,000 women were present — the largest attendance on record. Following a delicious lunch, Dayton's Department Store of Minneapolis entertained us with a fashion show.

Tuesday evening, the AVMA and auxiliary members were special guests at a "pop" concert and ice show at the Auditorium in St. Paul.

The Minnesota women celebrated the birthday of their auxiliary by entertaining members from all the auxiliaries for coffee Wednesday morning, which afforded a splendid opportunity to visit with old friends and get acquainted with new ones. At the annual meeting on Wednesday, interesting reports by officers and committees were read and officers were elected for the ensuing year (*see* October JOURNAL, p. 375).

Mrs. L. R. Richardson, Ravenna, Ohio, retiring president of the AVMA Women's Auxiliary, receives flowers from a "representative" of the Minneapolis Local Committee at the Ice Show on Tuesday evening during convention week.

The alumni dinners held at the various hotels provided a wonderful opportunity for the wives to meet their husband's classmates and listen to the news about their respective alma maters. Following the dinners, the president's reception and dance was held at the Radisson and Nicollett hotels.

An interesting and entertaining program was provided for the teenagers and sub-teenagers. These groups have been increasing each year and it creates a warm feeling to know our conventions are becoming family affairs.

At the Closing Session in the Auditorium, the new AVMA officers and the officers of the Women's Auxiliary were installed.

Again we say to the veterinarians and wives from Minnesota, "a sincere thank you for a wonderful meeting which we shall long remember."

s/(MRS. E. A.) MARION A. WOELFFER,
Second Vice-President.

No invitation is necessary to become a member of the Women's Auxiliary to the AVMA. We welcome all interested women. The dues are only $2.00 per year. Just write to:
Mrs. Frank R. Booth, secretary, Elkhart, Ind.

Officers Represent Auxiliary at Annual Meetings.—During September and October, officers of the Women's Auxiliary to the AVMA attended the following annual meetings of auxiliaries held in connection with meetings of veterinary medical associations: Mrs. A. E. Coombs, Skowhegan, Maine, president-elect, the annual meeting of the New York State V.M.A. in New York City, September 14-16; Mrs. C. M. Rodgers, Blandinsville, Ill., membership secretary, the joint meeting of the Florida-Southern V.M.A. in Jacksonville, Fla., October 16-19, and the Mississippi Valley V.M.A. in Peoria, Ill., on October 26-27; Mrs. U. E. Marney of San Antonio, Texas, also attended the Florida-Southern meeting; Mrs. J. D. Stevens, Sequim, Wash., Washington State V.M.A., in Bellingham, September 23-24; and Mrs. E. N. Moore, president, the Pennsylvania V.M.A. in Pocono Manor, October 13-15.

s/(MRS. EARL N.) LEOLA MOORE, *President.*

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Cuyahoga County (Ohio) Auxiliary Organized.—The Women's Auxiliary to the Cuyahoga County Veterinary Medical Association was organized Feb. 9, 1955. We were honored to have as our speaker, Mrs. Richardson, president of the Women's Auxiliary to the AVMA.

In March, the following officers were elected: Mrs. H. E. Jensen, University Heights, president; Mrs. J. J. Lyman, Cleveland, first vice-president; Mrs. J. F. Robertson, second vice-president; Mrs. W. W. Hafenbrack, Bedford, secretary; Mrs. H. S. Bernstein, Bedford, corresponding secretary; and Mrs. R. D. Larcey, Rocky River, treasurer.

Meetings are held regularly on the first Wednesday of the month at 9:00 p.m. The place of meeting occasionally varies according to the program but is usually held at the Carter Hotel in Cleveland. The meetings have usually been social and have included a boat ride on the Cuyahoga River and a trip through General Electric Lighting Research Laboratories. On the agenda for meetings of the fall series are a party food demonstration, gift wrapping, flower arrangements, interior decorating, and a display and discussion of precious stones. Mimeographed directories and program booklets have been prepared by the membership chairman, Mrs. W. K. Raub of Berea.

s/MRS. ELIZABETH S. GRUNDISH, *Historian.*
MRS. H. E. JENSEN, *President.*

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Greater St. Louis Auxiliary.—At the September 2 meeting of the Women's Auxiliary to the Greater St. Louis (Mo.) Veterinary Medical Association, the following officers were installed: Mrs. A. R. Bott, Collinsville, Ill., president; Mrs. George L. Murphy, Kirkwood, vice-president; Mrs. B. F. Ward, Alton, Ill.,

treasurer; Mrs. Allen B. Shopmaker, Clayton, secretary; and Mrs. C. B. Ragland, Alton, Ill., historian.

s/MRS. ALLEN B. SHOPMAKER, *Secretary.*

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Michiana Auxiliary.—The Women's Auxiliary to the Michiana Veterinary Medical Association met June 9 at the Hotel LaSalle in South Bend, Ind., for its regular monthly meeting. Following the business meeting, the members spent the evening playing "barks," and the ways and means committee reported that $53 was collected.

On July 17, the Auxiliary and the men's group had a joint meeting with a picnic at Benton Harbor, Mich. Well over 100 veterinarians, their wives, and children attended the event.

The September 8 meeting at the Hotel LaSalle followed a dinner with the husbands. Several reports were given on the national convention in Minneapolis. Ten members of the Michiana Auxiliary attended the convention with their husbands.

s/(MRS. L. D.) ELAINE RAMSAY, *Secretary.*

COMMENCEMENT

University of Montreal.—At the 1955 commencement exercises of the School of Veterinary Medicine of the Province of Quebec, University of Montreal, the following 22 candidates were presented for the D.V.M. degree:

Jean-Marie Bois	Gaston Lambert
Gaston Boulay	René Malo
Robert Bourgeois	Léo-Paul Manseau
Simon Carriere	Richard Morin
Jacques Caumartin	Rosaire Noel
Olivier Garon	Jean-Baptiste Phaneuf
Jean-Guy Hebert	Charles Rondeau
Fernand Houle	Ernanno-S. Rusich
Arne Johansson	Martin Safar
Jean-Noel Jourdain	Guy St. Georges
Louis La Haye	René Veilleux

Graduating Class, 1955, School of Veterinary Medicine of the Province of Quebec, University of Montreal

First row (top), left to right—Drs. Gustave LaBelle, Joseph DuFresne, J. D. Nadeau, Rév. Père L. M. Dube, Dr. Jacques St. Georges, and Mgr. Olivier Maurault.

Second row—Jean-Baptiste Phaneuf, Jean-Marie Bois, Fernand Houle, Guy St. Georges, Olivier Garon, Ernanno-S. Rusich, Jean-Guy Hebert, Rosaire Noel, Simon Carriere, and Martin Safar.

Third row—Louis La Haye, Léo-Paul Manseau, Arne Johansson, René Veilleux, Gaston Boulay, Jacques Caumartin, René Malo, Robert Bourgeois, Richard Morin, Jean-Noel Jourdain, Gaston Lambert, and Charles Rondeau.

APPLICATIONS

Applicants—Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative Bylaws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., the names of applicants residing within the jurisdictional limits of the constituent association shall be published once in the JOURNAL.

The following applicants have been certified as members of the constituent association that has jurisdiction over the area in which the applicant resides. This certification was made by the secretary of the constituent association in accordance with Section 2, Article X, of the Administrative Bylaws.

ARCHIBALD, JAMES
69 Dundas Rd., Guelph, Ont.
D.V.M., Ontario Veterinary College, 1949.

BARSHINGER, FREDERICK L.
Oxford, Pa.
V.M.D., University of Pennsylvania, 1934.

BROWN, SIDNEY
2100 Eglinton Ave., N., Toronto, Ont.
D.V.M., Ontario Veterinary College, 1947.

CAVANAUGH, FRANCIS J.
808 W. Broad St., Quakertown, Pa.
V.M.D., University of Pennsylvania, 1947.

GRIFFEL, R. H.
Ackley, Iowa.
D.V.M., Iowa State College, 1933.

HALVER, D. L.
Shakopee, Minn.
D.V.M., Iowa State College, 1922.

HOLIAN, WOLODYMYR E.
Melrose, Minn.
D.V.M., Lemberg (Lwow) Veterinary College (Poland), 1934.

JOHNSTON, KENNETH E.
446 W. Garland, West Salem, Wis.
D.V.M., Iowa State College, 1952.

JORGENSEN, IRVIN
204 Grant St., Spring Valley, Minn.
D.V.M., Royal Veterinary College, Denmark, 1943.

LENZ, ROBERT J.
Lisbon Rd., Mt. Vernon, Iowa.
D.V.M., Iowa State College, 1942.

LUDVIGSON, DEAN F.
Box 22, Ridgeland, Wis.
D.V.M., Iowa State College, 1946.

METCALF, FRANK
Seymour, Wis.
D.V.M., Michigan State University, 1946.

PETRYNA, WASYL T.
Cosmos, Minn.
D.V.M., Lemberg (Lwow) Veterinary College (Poland), 1935.

SCHLADWEILER, A. J.
Madison, Minn.
D.V.M., Iowa State College, 1932.

SNYDER, ROBERT A.
15022 Lincoln Ave., Dolton, Ill.
D.V.M., Iowa State College, 1949.

STANFORD, EDWARD T., D.V.M.
P.O. Box 494, Nashville, Tenn.
D.V.M., Texas A. & M. College, 1955.

WERRING, DEAN W.
Irving Ave., S.W., Wadena, Minn.
D.V.M., Iowa State College, 1947.

Applicants—Not Members of Constituent Associations

In accordance with paragraph (b) of Section 2, Article X, of the Administrative Bylaws, as revised at the annual meeting of the House of Representatives, Aug. 18, 1951, in Milwaukee, Wis., notice of all applications from applicants residing outside of the jurisdictional limits of the constituent associations, and members of the Armed Forces, shall be published in the JOURNAL for two successive months. The first notice shall give the applicant's full name, school, and year of graduation, post office address, and the names of his endorsers.

First Listing

ELLIS, PETER R.
Pan American Foot-and-Mouth Disease Center, Caixa 589, Rio de Janeiro, Brazil.
B.Sc., Royal (Dick) Veterinary College, Scotland, 1947.
Vouchers: C. Brandly and M. Shahan.

HEIDELBAUGH, NORMAN D.
7272nd USAF Hospital, APO 231, New York, N. Y.
V.M.D., University of Pennsylvania, 1954.
Vouchers: W. F. Jackson and E. F. Thomas.

SPRINKLE, DAVID G.
1707 E. 5th St., Vancouver, Wash.
D.V.M., Alabama Polytechnic Institute, 1941.
Vouchers: T. A. Ward and J. H. Harrison.

TISHMAN, SIDNEY
4800 Ritchie Highway, Baltimore, Md.
D.V.M., University of the Philippines, 1955.
Vouchers: H. Sher and T. N. Gounaris.

Second Listing

HUBBEN, KLAUS, 522 Penn St., Newtown, Pa.

PEGG, CHARLES E., 25 Elder Ave., Yeadon, Pa.

QUIGLEY, JOSEPH S., Quartermaster Inspection Service Command, Santee St., 5th Floor, Los Angeles, Calif.

REED, IRVIN T., Area Veterinarian, 6003 SU, Fort Ord, Calif.

STEWART, RICHARD W., Room 328, Post Office Bldg., Madison, Wis.

URBINA, HUMBERTO J. R., P. O. Box 2922, Lima, Peru.

Graduate Applicants

The following are graduates who have recently received their veterinary degree and who have applied for AVMA membership under the provision granted in the Administrative Bylaws to members in good standing of student chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of

a school indicates that all of this year's graduates have made application for membership.

First Listing

University of California

CONSTANTINE, DENNY G., D.V.M.
Newton Field Station Unit, Communicable Disease Center Activities, U. S. Public Health Service, Newton, Ga.
Vouchers: E. S. Tierkel and J. H. Steele.

Colorado A. & M. College

BLACKBURN, BRUCE W., D.V.M.
Fairfield, Neb.
Vouchers: W. H. Beckenhauer and W. A. Aanes.

Iowa State College

HYMAS, CHARLES J., D.V.M.
936 A St., Orland, Calif.
Vouchers: I. A. Merchant and H. D. Bergman.

Michigan State University

ENGEL, ERNEST F., D.V.M.
107 Center St., Mt. Carroll, Ill.
Vouchers: L. W. Derrer and F. W. Siefert.

University of Minnesota

JOHNSON, DEAN F., D.V.M.
Rt. 3, Mankato, Minn.
Vouchers: W. T. S. Thorp and J. P. Arnold.
STEVENS, CHARLES E., D.V.M.
3316 4th Ave., S., Minneapolis, Minn.
Vouchers: B. S. Pomeroy and W. T. S. Thorp.

University of Montreal

RUSICH, ERNANNO STELIO, D.V.M.
11145 68th St., Edmonton, Alta.
Vouchers: R. Pelletier and M. Trepanier.

Oklahoma A. & M. College

FREEMAN, C. PERRY, D.V.M.
3057 Oxford, Jackson, Miss.
Vouchers: T. S. Ozier and J. B. Tillery.
HUTTON, FRED L., D.V.M.
949 North Winter, Salem, Ore.
Vouchers: L. M. Anderson and K. Erickson.

Ontario Veterinary College

McISAAC, J. C., D.V.M.
Box 175, Unity, Sask.
Vouchers: J. A. Henderson and F. J. Milne.

Texas A. & M. College

CARLOSS, FRANK R., D.V.M.
No. 8 Peggy Ann Ave., Alexandria, La.
Vouchers: E. F. Rodriquez and R. R. Cowart.
WILLMANN, EDGAR R., D.V.M.
520 E. Myrtle St., San Antonio, Texas.
Vouchers: R. L. Rhea and J. G. Goodman.

Tuskegee Institute

HENDERSON, GORDON L., D.V.M.
Rt. 6, Box 245, Terrell, Texas.
Vouchers: G. W. Cooper and J. H. White, Jr.

Second Listing

Colorado A. & M. College

HURRY, JAMES J., D.V.M., P. O. Box 82, Helena, Mont.
HUTCHERSON, BRIAN L., D.V.M., University of California, Veterinary Clinic, Davis, Calif.
ROBERTS, FRED J., D.V.M., 5000 S. Sante Fe, Littleton, Colo.

Cornell University*

AARONSON, JULES, D.V.M., New York State Veterinary College, Cornell University, Ithaca, N. Y.
ALEXANDER, JOHN R., D.V.M., 411 S. Columbus Blvd., Tucson, Ariz.
BANDEMER, HERBERT L., D.V.M., 242 DuBoice Rd., Ithaca, N. Y.
BECK, DONALD G., D.V.M., Millerton, N. Y.
BRAEMER, ALLEN C., D.V.M., Pine Tree Animal Hospital, Western Ave., M.R.5, Augusta, Maine.
CALNEK, BRUCE W., D.V.M., 206 Stewart Ave., Ithaca, N. Y.
CHILDRESS, JAMES P., D.V.M., South Main St., Cheshire, Conn.
CLAUSEN, ALFRED C., D.V.M., Box 243, Centereach, N. Y.
CORNELL, ROBERT E., JR., D.V.M., Box 277, Greenwich, Conn.
DELGADO, RICHARD J., D.V.M., 3921 Main St., Buffalo, N. Y.
DIETRICH, HERBERT C., D.V.M., 4 Church St., Canton, N. Y.
FLEMER, JOHN W., D.V.M., Carnegie Lake Rd., Princeton, N. J.
FREEMAN, MAX E., D.V.M., P. O. Box, North Manchester, Ind.
FRIDERICI, ARTHUR J., D.V.M., 2764 Troy Rd., Schenectady, N. Y.
FRIEDLANDER, ALFRED I., D.V.M., 231-01 Merrick Rd., Springfield Gardens, N. Y.
GALPIN, SAMUEL J., D.V.M., c/o Somerset Veterinary Infirmary, Rt. 22, Somerville, N. J.
GARBUTT, THOMAS W., D.V.M., 367 E. 62nd St., New York, N. Y.
GREENBERG, MYLES A., D.V.M., 9 Bronson Ave., Scarsdale, N. Y.
HARLING, DAVID E., D.V.M., 2235 Elmwood Ave., Buffalo, N. Y.
HERSHHORN, BERNARD S., D.V.M., 28 Long Ridge Rd., Stamford, Conn.
HILLMAN, ROBERT B., D.V.M., Kelsey, N. Y.
HOCHMAN, HOWARD A., D.V.M., 315 E. 88 St., New York, N. Y.
HOLMES, FREDERICK M., D.V.M., New Woodstock, N. Y.
JOHNSTON, WILLIAM L., D.V.M., Avoca, N. Y.
KELLEY, PATRICK E, D.V.M., 607 "E" St., Davis, Calif.
KENNEDY, ROBERT L., D.V.M., 70 Argyle Place, Rockville Centre, N. Y.

Kohler, Robert G., D.V.M., 215 Middleneck Rd., Great Neck, N. Y.
Kowalk, Arthur J., D.V.M., R. D. 2, Delanson, N. Y.
Kradel, David C., D.V.M., 108 Catherine St., Ithaca, N. Y.
Krohn, Frank L., D.V.M., R.F.D. 1, Great Barrington, Mass.
Leskovar, Richard F., D.V.M., 13 Ward St., Little Falls, N. Y.
Little, Robert G., Jr., D.V.M., 2075 Lycoming Creek Rd., Williamsport, Pa.
McBride, Douglas F., D.V.M., Klondyke Rd., Ripley, N. Y.
Manning, Robert V., D.V.M., R.D. 2, Pine City, N. Y.
Meek, John C., D.V.M., Bloomville, N. Y.
Murtha, Thomas J., D.V.M., c/o A. H. Russell, Baker Ave., Concord, Mass.
Newman, Jane R., D.V.M., Poland, N. Y.
Pelloth, Donald E., D.V.M., 152 Wellington Rd., Buffalo, N. Y.
Pentek, John, Jr., D.V.M., 100 Lisbon Ave., Buffalo, N. Y.
Presley, Edwin T., D.V.M., 23 Delano St., Pulaski, N. Y.
Rasmusen, Benjamin A., D.V.M., School of Veterinary Medicine, University of California, Davis, Calif.
Sacks, Gerald J., D.V.M., 180 Longwood Ave., Boston, Mass.
Saunders, Burton, D.V.M., 1312 S. Division St., Peekskill, N. Y.
Stuart, Joseph, D.V.M., 1 Carrigan Ave., White Plains, N. Y.
Terwilliger, Howard J., D.V.M., 24 Emerson St., Kingston, N. Y.
Tweedle, Harry V., D.V.M., R.D. 2, Ithaca, N. Y.
VanName, Richard C., D.V.M., 1624 Main St., Buffalo, N. Y.
Wallace, Lee A., D.V.M., Linden Hills, Rt. 6, Frederick, Md.

Iowa State College

Strom, Duane I., D.V.M., New Vienna, Iowa.

University of Minnesota

Hartman, Warren C., II, D.V.M., 603 3rd St., S.W., Wadena, Minn.

Texas A. & M. College

Criswell, Warren A., D.V.M., P.O. Box 1106, Bay City, Texas.
Drew, Gerald C., D.V.M., Rt. 2, Pittsburg, Texas.
Hoffman, Rudolf A., D.V.M., Rt. 1, Ballinger, Texas.
Holt, Archie J., Jr., D.V.M., 224 E. Rix, Tyler, Texas.
Hosek, Jerry J., D.V.M., 909 Columbus Ave., Waco, Texas.
Ray, Benjamin B., D.V.M., Box 149, Alamogordo, N. M.
Smith, Seymour J., Jr., D.V.M., Rt. 1, Opelousa, La.
Westbrook, Billy R., D.V.M., 709 Hunter Dr., Rockdale, Texas.
Williams, David E., D.V.M., 3 Garden Ave., Ithaca, N. Y.
Willis, Charles E., D.V.M., Box 492, Miller, S. Dak.

U. S. GOVERNMENT

Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U.S.D.A. Agricultural Research Service are reported as of Sept. 23, 1955.

NEW APPOINTMENTS

John E. Anderson, Jacksonville, Fla.
Bronius Andrasiunas, Milwaukee, Wis.
Walter J. Baringrover, Sacramento, Calif.
Kendell O. Belfield, Newark, N. J.
Jack M. Bennett, Lincoln, Neb.
George B. Bilyk, Reading, Pa.
Richard F. Dean, Lincoln, Neb.
Gerald C. Drew, Fort Worth, Texas.
Eugene Gill, Beltsville, Md.
John Gliaudelis, Chicago, Ill.
Fritz P. Gluckstein, South St. Paul, Minn.
Henry W. Harper, Fort Worth, Texas.
Joseph A. Jones, Kansas City, Kan.
Arthur S. Johnson, Portland, Ore.
Edward M. Krivacek, South St. Paul, Minn.
Algimantas J. Kurgonas, Chicago, Ill.
Wilkie H. Lee, Knoxville, Tenn.
Roy W. Lybreck, Phoenix, Ariz.
Ralph Clarke Manfull, Jefferson City, Mo.
Billy Robert Mayse, Fort Worth, Texas.
Robert H. Packard, Los Angeles, Calif.
Colin M. Robertson, Harrisburg, Pa.
William D. Smith, Wichita, Kan.
Boris Sulima, New York, N. Y.
John N. S. White, Los Angeles, Calif.
Sighle S. White, Los Angeles, Calif.
Harold B. Wright, Kansas City, Kan.
Roderick D. Zachary, Des Moines, Iowa.

REEMPLOYMENT—Military

Rex M. Maddox, Fort Worth, Texas.
Leonard D. Smith, Fort Worth, Texas.

CANCELLATION of Appointments

Hiram H. Faubion, Portland, Ore.
Stanley E. Peters, Baton Rouge, La.
Charles E. Puddy, Portland, Ore.
Joseph V. Sabaitis, Madison, Wis.
Louis Singleton, San Francisco, Calif.

RESIGNATIONS

Stephen Antic, Harrisburg, Pa.
William L. Austin, Moultrie, Ga.
Charles C. Curry, Chicago, Ill.
Gerald A. Eddy, Lansing, Mich.
James F. Hallmark, Fort Worth, Texas.
Henry M. Hans, Portland, Ore.
Chester N. Harden, Boston, Mass.
Charles A. Hazzard, Newark, N. J.
Vaughn W. Morrison, Indianapolis, Ind.
John C. Stokes, Milwaukee, Wis.

RETIREMENTS

Martin M. Davis, Pierre, S. Dak.
Wesley A. Decker, Denver, Colo.
Loren Flora, Sioux Falls, S. Dak.
Clark H. Hays, Lansing, Mich.
Ashley G. Stamp, Cleveland, Ohio.
Lyle B. Whitney, Albany, Calif.
Clarence F. Wilson, Chicago, Ill.

RESIGNATION—No Return from Military Furlough

Donald L. Anderson, Little Rock, Ark.
Erby L. Massie, Baltimore, Md.

TERMINATION and SEPARATION

Thomas P. Strittmatter, Cincinnati, Ohio.
John Krupsky, Springfield, Mass.

TRANSFERS

Eldon C. Barclay, from Lansing, Mich., to Champlain, N. Y.
Paul P. Boriskie, from Phoenix, Ariz., to Baton Rouge, La.
Raymond E. Caldwell, from Allentown, Pa., to South St. Joseph, Mo.
Le Roy T. Fisher, from Jackson, Miss., to Baton Rouge, La.
C. Frederick Green, from Los Angeles, Calif., to Harrisburg, Pa.
Harry T. Grossman, from Flint, Mich., to Detroit, Mich.
Frederic W. Hansen from Denver, Colo., to Wichita, Kan.
Frederic W. Hansen, Jr., from Montpelier, Vt., to Oklahoma City, Okla.
James D. Hatton, from Reading, Pa., to Evansville Ind.
Earl F. Huffman, from Cheyenne, Wyo., to Madison, Wis.
Leonard Jackel, from New York, N. Y., to Albany, N. Y.
James M. Mathis, from Nashville, Tenn., to Houston, Texas.
William J. Minor, from Chicago, Ill., to Green Bay, Wis.
Dale D. Osbel, from Kansas City, Kan., to Pearl River, N. Y.
Leslie J. Rafoth, from Green Bay, Wis., to Chicago, Ill.

AMONG THE STATES AND PROVINCES

The deadline for news copy is the 24th of the month, two months preceding the month of issue

Alabama

Central Association.—The August 4 meeting of the Central Alabama Veterinary Medical Association was held at Maxwell Air Force Base. After a short business session, with Lt. Col. Robert L. Hummer, president, presiding, the following speakers addressed the group: **Dr. H. C. Morgan,** Alabama Polytechnic Institute, Auburn (parenteral fluids); and **Dr. Richard W. Winters,** Lederle Laboratories, Pearl River, N. Y. (immunization). Among the honored guests was Dr. R. S. Sugg, dean of the School of Veterinary Medicine, A.P.I.

S/WILLIAM H. WATSON, JR., *Chairman, Public Relations Committee.*

Canada

Canadian Association.—The seventh annual meeting of the Canadian Veterinary Medical Association was held at the Bessborough Hotel in Saskatoon, Sask., Sept. 12-14, 1955.

The program listed the following speakers and their subjects: **Drs. Kenneth F. Wells,** Ottawa, Ont. (control problems of contagious diseases); **D. C. Maplesden,** Guelph, Ont. (trends in large animal practice); **George Burch,** Zionsville, Ind. (research with anthelminthic drugs); **Paul Genest,** St. Hyacinthe, Que. (the ring test in Quebec); **E. E. Ballantyne,** Edmonton, Alta. (rabies control); **Lt. Col. W. O. Kester,** president-elect of the AVMA (Association activities); **F. M. Clark,** Saskatoon, Sask., **S. E. Magwood,** Sussex, N. B., and **J. M. Saville,** Wainright, Alta. (symposium on practice problems); **M. L. Olsen,** Victoria, B. C. (fracture repair in small animals); **Joseph Dufresne,** St. Hyacinthe, Que. (modern trends in veterinary medicine); **D. G. Dale,** Macdonald College, Que. (fluorine problem in livestock); **J. G. O'Donoghue,** Edmonton, Alta. (vitamin A deficiencies in cattle); **Floyd Markham,** Pearl River, N. Y. (live virus vaccines); **Maurice Panisset,** Montreal, Que. (veterinary training); **W. D. Persson,** Vancouver, B. C. (surgical techniques for small animals); **C. E. Phillips,** St. Joseph, Mo. (swine immunity with erysipelas bacterin); **C. I. Chappel,** Montreal, Que. (new antiseptic and fungicide); and **Jacques St. Georges,** St. Hyacinthe, Que. (spotlight on the veterinarian).

S/ORLAN HALL, *Secretary.*

Colorado

Personals.—Dr. R. A. Paige (COL '26), of Grand Junction, last May delivered a calf weighing 187 lb. from a 5-year-old Holstein-Friesian cow. She was bred by artificial insemination 311 days prior to delivery. A rear presentation, the dead calf was delivered without embryotomy.—*Rocky Mt. Vet., June, 1955.*

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Dr. Jean C. Flint (COL '32), has sold his practice and hospital in Salt Lake City, Utah, to Dr. D. H. McKelvie (COL '52) and moved to Fort Collins, where he became an associate professor in veterinary pathology. Dr. Flint returned to Colorado A. & M. College in 1949 to earn his masters degree in veterinary pathology; and in 1950-1951, he obtained his Ph.D. degree at the University of Minnesota, his thesis being "Feline Infectious Anemia." He has just completed a three-year term as the representative for small animal medicine on the AVMA Research Council.

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Dr. and Mrs. Lloyd Moss of Fort Collins, are enjoying a year-long tour of Europe, Asia, and Africa. Dr. Moss (WSC '23) is professor and head of veterinary medicine at Colorado State College.

Connecticut

Dr. Dimock Honored.—More than 400 persons attended a testimonial dinner in honor of Dr. Edwin R. Dimock, of Merrow, on August 23 at the University of Connecticut in Storrs. Dr. Dimock has been a practicing veterinarian in the state for 45 years. He is a past-president of the Connecticut Veterinary Medical Association, a former commissioner of domestic animals, and has served as state representative, state senator, and has held other civic offices. During the evening, Dean

W. B. Young of the College of Agriculture at the University presented him with a certificate citing his outstanding accomplishments as a practicing veterinarian. Dr. Dimock also received a television set and a cash gift.

District of Columbia

Death of Dr. C. Theodore Beechwood.—Dr. C. Theodore Beechwood died Aug. 23, 1955, in Beirut, Lebanon, of a heart attack. He was 59 years old.

Dr. Beechwood was currently attached to the American Embassy in Beirut as a veterinarian with the International Cooperative Administration (Point-Four program). He had spent several months early this year visiting relatives in this country and, with his wife, had only recently returned to Lebanon.

During World War I, Dr. Beechwood served as an officer with the Army Veterinary Corps. Prior to World War II, he worked with a dairy company in Pennsylvania and in 1945 became associated with the U. S. Public Health Service. In 1946, Dr. Beechwood was among the first group of civilians to enter Korea to administer technical aid to that country for the U. S. Government. During the first two years in Korea, he was largely responsible in helping reestablish a veterinary college. He accepted an assignment in Tokyo in a similar capacity in 1947 and remained there until 1952 except for a return to Korea in a civilian capacity when he cared for the movement and sanitation of homeless refugees. General Matthew B. Ridgway, S.C.A.P., awarded him one of this country's highest civilian citations for these services. In Japan, the Tokyo Metropolitan V.M.A. and the Japan V.M.A. extended to him honorary life membership in appreciation of his support and guidance to their associations. After returning to this country on leave, in 1953, Dr. Beechwood accepted his first assignment in Beirut, Lebanon. The highest award of merit of that country was presented to his widow for his outstanding services there.

Dr. Beechwood was affiliated with several professional groups including the AVMA, to which he was admitted in 1944.

He was interred with military honors at Arlington National Cemetery, Washington, D. C., on August 31.

Illinois

Northern Association.—The thirty-fourth annual meeting of the Northern Illinois Veterinary Medical Association was held September 28 at the Hotel Faust in Rockford.

The following speakers addressed the group: **Drs. C. L. McGinnis**, Peoria (small animal practice); **A. H. Craige, Jr.**, Indianapolis, Ind. (leptospirosis); **B. L. Lake**, Rockford (history of the Association); **J. D. Ray**, White Hall (enteritis and pneumonia complex); **A. L. Starkey**, McLean (shipping fever in cattle); and **Lewis E. Harris**, M.Sc., Lincoln, Neb. (endocrinology).

s/E. C. HANNAN, *Secretary.*

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Mississippi Valley Association.—The fifty-first annual meeting of the Mississippi Valley Veterinary Medical Association was held at the Hotel Pere Marquette in Peoria.

The group enjoyed informative discussions by **Dr. John R. Dick**, Fort Dodge, Iowa; **J. F. Knappenberger**, Kansas City, Mo.; **H. J. Hardenbrook**, Urbana; and **V. W. Gellen**, Omaha, Neb.

s/W. L. BEER, *Secretary.*

Indiana

Michiana Association.—The Michiana Veterinary Medical Association met on June 9 at the Hotel LaSalle in South Bend. Following the dinner meeting with the auxiliary, the group heard a lecture by **Dr. L. P. Doyle**, Purdue University, Lafayette, on diseases of swine.

In place of the regular business meeting in July, the Association held the annual family picnic at Benton Harbor, Mich. More than 100 persons attended the picnic and swimming party.

Mr. Harry Davis, professional management consultant, spoke to the members at the September 8 meeting in South Bend.

s/L. D. RAMSAY, *Secretary.*

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Indiana-Illinois Association.—On September 16, members of the Indiana-Illinois Veterinary Medical Association met in Bedford, Ind., to hear **Dr. C. Turbes** of Bloomington discuss tremors in dogs and swine. Dr. Turbes is an instructor at Indiana University. The women provided a banquet of fried chicken with all the trimmings.

Officers of this Association are Dr. Odell Archer, Terre Haute, Ind., president; and R. H. DeMotte, Odon, Ind., secretary-treasurer.

s/J. L. KIXMILLER, *Resident Secretary.*

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Tenth District Association.—The Tenth District (Ind.) Veterinary Medical Association met in Indianapolis on September 9. The speakers were **Dr. J. D. Ray**, White Hall, Ill. (erysipelas and leptospirosis in swine); and **Dr. L. A. Barnes** of the BAI in Indiana (regulatory measures).

s/J. L. KIXMILLER, *Resident Secretary.*

Kansas

Dean Leasure Returns from India.—Dean E. E. Leasure of the School of Veterinary Medicine, Kansas State College, recently returned from a three-month assignment in India with the International Cooperative Administration, formerly the F.O.A. With 2 other scientists, he surveyed all parts of India and made recommendations to the International Cooperative

Administration with regard to agricultural education and research.

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Central District Association.—The summer quarterly meeting of the Central District (Kan.) Veterinary Medical Association was held in Hutchinson on July 17 with about 60 veterinarians, their wives, and families in attendance. The program was social, with Dr. and Mrs. J. C. Symns serving as hosts to the group. Entertainment included swimming, golf, and a fried chicken dinner.

s/K. M. CURTS, *Resident Secretary.*

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Southeast District.—On August 13, the Southeast District (Kan.) Veterinary Medical Association met at Dr. S. Lester Jackson's "Paint Creek Ranch" near Hiattville. Drs. Jackson, Art Carlson, and Ralph Bruce were sponsors.

The clinic consisted of surgical procedures, including varied techniques in castration of hogs and cattle, spaying of heifers, dehorning, and methods of restraint.

After an informal business meeting, the approximately 40 veterinarians and their wives and families enjoyed a potluck supper served at the Jackson's new home.

s/K. M. CURTS, *Resident Secretary.*

Kentucky

Death of Dr. Stifler.—John R. Stifler (USC '11), 66, Danville, died Aug. 30, 1955. A former president of the Kentucky V.M.A. (1933-1934), Dr. Stifler served in the Army Veterinary Corps in World War I with duty at Camp Greenleaf, Ga., as an instructor at the veterinary training school at Camp Lee, Va., and with Veterinary Hospital No. 10, A.E.F.; also at Fort Oglethorp, Ga. He had practiced in Kentucky for many years; at the time of his death, he was an employee of the State Welfare Department. Dr. Stifler had been an AVMA member since 1918.

Massachusetts

State Association.—The regular monthly meeting of the Massachusetts Veterinary Association was held September 21 at the Hotel Shelton in Springfield.

After the business session, **Dr. Mark W. Allam,** dean of the School of Veterinary Medicine, University of Pennsylvania, discussed modern surgical techniques.

s/C. LAWRENCE BLAKELY, *Secretary.*

Michigan

Dr. Stafseth Author of Article in Public Health Journal.—Dr. Henrik J. Stafseth, who retired as head of the Department of Microbiology, College of Veterinary Medicine, Michigan State University, in April, 1955, is the author of an article "Veterinary Education and Public Health" in the July, 1955, issue of *Public Health Reports.*

Death of Dr. Frank Thorp, Jr.—Dr. Frank Thorp, Jr., 54, professor of pathology, College of Veterinary Medicine, Michigan State University, East Lansing, died on Sept. 9, 1955, in a hospital at Denver, Colo. He became ill while on a vacation after he and his family had completed a boat trip down one of the turbulent rivers in southwestern Colorado. The diagnosis was bulbar poliomyelitis.

Dr. Thorp was born at Panora, Iowa, in 1900, received his D.V.M. degree at Iowa State College in 1926 and his Ph.D. at the University of Illinois in 1956. He devoted his entire tremendous energy to research in animal diseases, particularly those of sheep and swine. He had served on the veterinary staffs at the University of Illinois, Colorado A. & M. College and, since 1940, at Michigan State College, where his assignment was primarily on experiment station work. He was author or co-author of approximately 100 technical articles and bulletins on nutritional diseases, listeriosis, hyperkeratosis, and other diseases.

Dr. Thorp was a member of the AVMA, Research Workers in Animal Diseases of North America, Society of American Bacteriologists, Society of Experimental Biology and Medicine, the American Association of Pathologists and Bacteriologists, and of six honorary societies.

He is survived by his widow, a son, and a daughter.

Mississippi

Northeastern Association.—The annual clinic of the Northeastern Mississippi V.M.A. was held at Corinth, Tuesday, September 13, with over 100 veterinarians from seven states attending. The clinic, and with it a delicious barbecue meal, are provided each year by Dr. W. L. Stroup (API '12). Animals treated included 5 horses, 6 cattle, 5 hogs, 9 dogs, and 4 cats.

Missouri

Greater St. Louis Association.—On September 2, members of the Greater St. Louis Veterinary Medical Association met in the Sheraton Hotel in St. Louis. During the business session, the following officers were installed: Drs. Luther E. Fredrickson, Highland, Ill., president; J. H. Evans, Jr., St. Charles, vice-president; H. S. Richards, University City, treasurer; and Allen B. Shopmaker, Clayton, secretary.

s/ALLEN B. SHOPMAKER, *Secretary.*
LUTHER E. FREDRICKSON, *Retiring Secretary.*

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Drs. Mundell and Baldwin Serve as Consultants in India.—Drs. Earl Mundell (KSC '41), Jensen-Salsbery Laboratories, Kansas City, and Earl M. Baldwin (WSC '42), Corn States Laboratories, Omaha, Neb., left September 19 for the Veterinary Biological Institute in Bereilly, India, where they served as instructors and consultants at a refresher course for labo-

ratory workers. They planned to return home via Thailand, Japan, and the Philippines early in November.

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Kansas City Association.—On September 20, the Kansas City Veterinary Medical Association met in the Livestock Exchange Building in Kansas City. The guest speaker, **Dr. Warren J. Kilpatrick** of Mediapolis, Iowa, discussed methods to increase efficiency of record keeping for veterinarians. Also, the film, "Turkey Diseases," from the AVMA film library was shown.

s/BUSCH MEREDITH, *Secretary.*

New Jersey

Death of Dr. James J. Black.—James J. Black (KSC '23), 62, Vineland, well-known poultry pathologist who had charge of the diagnostic laboratory of the Rutgers University experiment station in Vineland for 31 years, died Sept. 1, 1955. Born in Missouri in 1892, Dr. Black joined the Rutgers staff the year following his graduation from Kansas State College after having served as extension veterinarian in Kansas for a year. He devoted his professional career to poultry pathology and was author or co-author of many papers in that field.

Dr. Black was active in Boy Scout work and held the Silver Beaver Award for service to scouting. In 1954, he received the "Golden Egg," the New Jersey poultry industry's highest award for outstanding service to agriculture. He had been an AVMA member since 1924.

Surviving are his widow, the former Elsie Bowney, a daughter, and one sister.

New York

New York City Association.—The regular meeting of the Veterinary Medical Association of New York City, Inc., was held Oct. 5, 1955, at the New York Academy of Sciences. The guest speakers were: **Dr. Arthur J. Blau,** assistant deputy director, Medical Emergency Division, Office of Civil Defense, who discussed the role of the veterinarian in civil defense; and **Dr. John E. Martin,** School of Veterinary Medicine, University of Pennsylvania, whose subject was clinical endocrine disturbances in dogs.

s/C. E. DECAMP, *Secretary.*

Ohio

Dr. Koutz Appointed to Board of Health.—Dr. F. R. Koutz, Grandview Heights, was appointed to the City Board of Health on Sept. 19, 1955. Dr. Koutz is chairman of the Department of Veterinary Parasitology, Ohio State University. He is a veteran of World War II, having served as a major in the Veterinary Corps in the India and China theater of operations.

s/R. E. REBRASSIER.

Dr. Rebrassier Appointed Assistant Dean.—Dr. Russell E. Rebrassier (OSU '14) has been made assistant dean of the College of Veterinary Medicine, Ohio State University, Columbus. He has been a member of the faculty since 1916, head of the Department of Veterinary Parasitology since 1939, and secretary of the veterinary faculty since 1947. Dr. Rebrassier has served as secretary of the AVMA Council on Education since 1951.

Oklahoma

Dr. Riemenschneider, State Veterinarian.—Dr. M. N. Riemenschneider (COL '35) former practitioner in Gunnison, Colo., and state veterinarian of Colorado since 1951, became state veterinarian for Oklahoma on May 1, 1955, with residence in Oklahoma City.

Oregon

Personal.—Dr. Frank Gillette (KSC '40), veterinarian at Salem, was injured, by falling rock, last July while mountain climbing in the Cascades of Oregon. He was brought from the 10,000-ft. to the 6,000-ft. level by a team of experienced mountaineers, then taken by helicopter to a Salem hospital. His left ankle was fractured.—*Oregonian, July 26, 1955.*

Pennsylvania

Keystone Association.—At the September 28 meeting of the Keystone Veterinary Medical Association, **Drs. Alan Bachrach,** Philadelphia, **Donald Lee,** Drexel Hill, and **Ernest Stearly,** Phoenixville, presented some practical highlights of the AVMA Minneapolis convention papers. After a short business session, light refreshments were served.

s/RAYMOND C. SNYDER, *Secretary.*

South Dakota

State Association.—The annual meeting of the South Dakota Veterinary Medical Association was held at the Cataract Hotel in Sioux Falls on Oct. 12-13, 1955.

The program listed the following speakers and their subjects: **Drs. G. B. Rea,** state veterinarian, Pierre (disease conditions in the state); **J. D. Ray,** Affiliated Laboratories, White Hall, Ill. (swine diseases); **Robert Getty,** Iowa State College, Ames (nerve blocking in cattle); **Kenneth Rasmussen,** Watertown, and **Donald Mitchell,** Browns Valley, Minn. (cesarean section in the cow); **L. T. Railsback,** Ellsworth, Minn. (swine bleeding); **Vernon Jensen,** Montevideo, Minn. (swine practice); **E. A. Dornbusch,** Milbank (practice problems); **George W. Mather,** University of Minnesota, St. Paul (small animal practice problems); and **B. S. Pomeroy,** University of Minnesota, St. Paul (poultry diseases).

Members, their wives, and families enjoyed a banquet in the ballroom of the Cataract Hotel the evening of October 12.

s/J. L. NOORDSY, *Secretary.*

FOREIGN NEWS

New Zealand

Veterinary College Voted Down.—The Federated Farmers of New Zealand voted against the establishment of a veterinary college, feeling that "it was better that the money . . . should be spent on diagnostic centers and extension" departments. Since New Zealand needs only 10 or 12 new veterinarians annually, they could be educated in Australia, then sent to England or even to Africa to study diseases which might be important.—*New Zealand Dairy Reporter, June 1, 1955.*

STATE BOARD EXAMINATIONS

Texas—The Texas State Board of Veterinary Medical Examiners announces that the next veterinary licensing examination will be held Jan. 11-13, 1956, at Austin, Texas. The completed applications must be returned to the following address not later than 30 days before the examination date. Requests for applications and additional information should be addressed to: Mr. T. D. Weaver, Executive Secretary, Texas State Board of Veterinary Medical Examiners, 520 Littlefield Bldg., Austin 15, Texas.

VETERINARY MILITARY SERVICE

Veterinarians Attend Course on Management of Mass Casualties.—Officers responsible for veterinary activities in the Army areas of continental United States participated in the course on the management of mass casualties given at the Walter Reed Army Medical Center, Washington, D. C., from September 12 to 17.

The group consisted of Col. Richard G. Yule, First Army; Col. Edgerton L. Watson, Second Army; Col. Mervyn B. Starnes, Third Army; Col. Harvie R. Ellis, Fourth Army; Col. Walter Smith, Fifth Army; Col. Russell McNellis, Sixth Army; and Maj. Don E. Guy, Military District of Washington.

Prior to departing for a new assignment in Europe, Lt. Col. William F. Collins (left), station veterinarian at Fort Sam Houston, Texas, was presented a certificate of achievement by Col. Howard R. Cress, the deputy post commander. First Lieutenant John E. Donaldson (right) also received the certificate which read in part, ". . . in recognition of the high standard of efficiency displayed, and the fidelity, cooperation and devotion to duty demonstrated during his assignment as station veterinarian of this post . . ."

DEATHS

★**C. Theodore Beechwood** (UP '18), 59, Washington, D. C., died Aug. 23, 1955, from a heart attack. An obituary appears on page 473 of this JOURNAL.

★**James J. Black** (KSC '23), 62, Vineland, N. J., died Sept. 1, 1955. An obituary appears on page 475 of this JOURNAL.

★**George J. Gruenewald** (MCK '14), 65, Maplewood, N. J., died Aug. 28, 1955. Dr. Gruenewald had been employed by the BAI (now ARS), U. S. Department of Agriculture, since November 1914. He was a member of the New Jersey Veterinary Medical Association, the National Association of Federal Veterinarians, and had been admitted to the AVMA in 1915. His widow and one daughter survive.

★**H. Meade Hamilton** (IND '09), 67, Muncie, Ind., died Sept. 12, 1955. Dr. Hamilton, had served on the board of directors of the Indiana Veterinary Medical Association for two terms and as its president in 1929. He also served three terms as a member of the State Livestock Sanitary Board, helped organize the Tenth District (Ind.) V.M.A. and served as its first president. Dr. Hamilton was admitted to the AVMA in 1909. His widow survives.

★**Harvey E. Horel** (CVC '11), 71, Augusta, Wis., died July 28, 1955. Dr. Horel, a general practitioner, was active in civic affairs and was a member of the Wisconsin Veterinary Medical Association and of the AVMA. Surviving are his widow and three sons.

★**George H. Kinemond** (UP '26), 55, Philadelphia, Pa., died late in September, 1955. Dr. Kinemond, a general practitioner, was a member of the Pennsylvania and Keystone Veterinary Medical Associations and of the AVMA. He had served as head of the clinic at the Pennsylvania S.P.C.A. He is survived by his widow and a son.

Albert J. Schoen (TH '17), 64, Highland, Ill., died March 22, 1955. Dr. Schoen had been employed by the federal government. He retired three years ago.

Frank R. Smythe (CIN '09), Saguache, Colo., died June 16, 1955. Dr. Smythe was a general practitioner.

★**John R. Stifler** (USC '11), 66, Danville, Ky., died Aug. 30, 1955. An obituary appears on page 474 of this JOURNAL.

★**Frank Thorp, Jr.** (ISC '26), 55, East Lansing, Mich., died Sept. 9, 1955. An obituary appears on page 474 of this JOURNAL.

★Indicates members of the AVMA.

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COMING MEETINGS

Notices of Coming Meetings must be received by 4th of month preceding date of issue

Interstate Veterinary Medical Association. Annual meeting. Martin Hotel, Sioux City, Iowa, Nov. 1-2, 1955. K. W. Smith, 510 W. 19th St., Sioux City, Iowa, secretary.

Association of Military Surgeons of the United States, Annual convention. Hotel Statler, Washington, D. C., Nov. 7-9, 1955. Address Secretary, Suite 718, New Medical Bldg., 1726 Eye St., N. W., Washington 6, D. C.

Midwest Small Animal Hospital Association and regional A.A.H.A. Joint meeting. Hotel Burlington, Burlington, Iowa, Nov. 9-10, 1955. J. Porter Coble, 2828 S. MacArthur Blvd., Springfield, Ill., secretary.

U. S. Livestock Sanitary Association. Annual meeting. Jung Hotel, New Orleans, La., Nov. 16-18, 1955. R. A. Hendershott, 1 W. State St., Trenton 8, N. J., secretary.

Animal Care Panel. Annual meeting. Henry Hudson Hotel, 353 W. 57th St., New York, N. Y., Dec. 1-2, 1955. Robert J. Flynn, P.O. Box 299, Lemont, Ill., secretary.

Kentucky Veterinary Medical Association. December meeting. Ken-Lake Hotel, Hardin, Ky., Dec. 5-6, 1955. Robert H. Singer, 136 Shawnee Pl., Lexington, Ky., secretary.

Cornell University. Annual conference for veterinarians. New York State Veterinary College, Cornell University, Ithaca, N. Y., Jan. 4-6, 1956. W. A. Hagan, dean.

Oklahoma Veterinary Medical Association. Annual meeting. Hotel May, Tulsa, Okla., Jan. 8-10, 1956. C. H. Fauks, 3421 N.W. 20 St., Oklahoma City, Okla., secretary.

Indiana Veterinary Medical Association. Annual meeting. Hotel Severin, Indianapolis, Ind., Jan. 11-13, 1956. L. M. Borst, 3315 Shelby Ave., Indianapolis, Ind., secretary.

Wisconsin Veterinary Medical Association. Annual meeting. Schroeder Hotel, Milwaukee, Wis., Jan. 11-13, 1956. B. A. Beach, 1215 Vilas Ave., Madison 5, Wis., secretary.

Intermountain Veterinary Medical Association. Annual meeting. Hotel Utah, Salt Lake City, Utah, Jan. 16-18, 1956. Edward A. Tugaw, 3015 S. State St., Salt Lake City, Utah, secretary.

Iowa Veterinary Medical Association. Annual meeting. Hotel Fort Des Moines, Des Moines, Iowa, Jan. 17-19, 1956. F. B. Young, Waukee, Iowa, executive secretary.

Virginia Veterinary Medical Association. Annual meeting. Hotel John Marshall, Richmond, Va., Jan. 22-24, 1956. Wilson B. Bell, 210 Clay St., Blacksburg, Va., secretary.

California State Veterinary Medical Association. Midwinter conference. School of Veterinary Medicine, University of California, Davis, Calif., Jan. 23-25, 1956. Charles S. Travers, 3004 16th St., San Francisco, Calif., executive secretary.

Maryland State Veterinary Medical Association. Winter meeting. Lord Baltimore Hotel, Baltimore, Md., Jan. 26-27, 1956. John D. Gadd, Cockeysville, Md., secretary.

Louisiana State University. Annual conference for veterinarians. Louisiana State University, Baton Rouge, La., Jan. 31-Feb. 1, 1956. W. T. Oglesby, head, Department of Veterinary Science.

Colorado A. & M. College. Conference for Veterinarians. Glover Veterinary Hospital, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., Feb. 20-22, 1956. O. R. Adams, Department of Veterinary Clinics and Surgery.

Foreign Meetings

Tenth International Congress of Entomology. McGill University and University of Montreal, Montreal, Canada, Aug. 17-25, 1956. J. A. Downes, Division of Entomology, Science Service Bldg., Ottawa, Ont., Canada, secretary.

International Association of Hydatidology. Sixth Congress. Athens, Greece, Sept. 14-18, 1956. Prof. B. Kourias, 1 MacKenzie King St., Athens, Greece, general secretary.

(Continued on p. 30)

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References: 1. Brown, A. L., et al.: To be published. 2. Agricultural Research Service, Losses in Agriculture, June 1954, Table 20, p. 129.

(COMING MEETINGS—*continued from p. 28*)

Regularly Scheduled Meetings

Atlanta (Ga.) Veterinary Society, the second Tuesday of every month at the Elks Home on Peachtree St., Atlanta, Ga. J. L. Christopher, Smyrna, Ga., secretary.

Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m. at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Harry L. Schultz, Jr., 9011 Harford Rd., Baltimore, Md., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of each month. E. Paul, Redwood City, Calif., secretary.

Cedar Valley Veterinary Association, the second Monday of each month, except January, July, August, and October, at Black's Tea Room, Waterloo, Iowa. D. A. Buchanan, Grundy Center, Iowa, secretary.

Central Alabama Veterinary Association, the first Thursday of each month. G. J. Phelps, Jr., Montgomery, Ala., secretary.

Central Arizona Veterinary Medical Association, the second Tuesday of each month. Keith T. Maddy, Phoenix, Ariz., secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Wilfred Pimentel, 3455 S. Elm Ave., Fresno, Calif., secretary.

Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel in Greensboro, N. Car. R. T. Copeland, 1800 Walker Ave., Greensboro, N. Car., secretary.

Central Indiana Veterinary Medical Association, the second Wednesday of each month. Charles J. York, P. O. Box 1656, Indianapolis 6, Ind., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Mark E. Davenport, Jr., 215 S. Edgewood Ave., LaGrange, Ill., secretary.

Coastal Bend (Texas) Veterinary Association, the second Wednesday of each month. J. Marvin Prewitt, 4141 Lexington Blvd., Corpus Christi, Texas, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. D. I. Lee, Sac City, Iowa, secretary.

Cuyahoga County (Cleveland, Ohio) Veterinary Medical Association, the first Wednesday of each month, September through May (except January), at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Ed. R. Jacobs, 5522 Pearl Rd., Cleveland, Ohio, secretary.

(*Continued on p. 32*)

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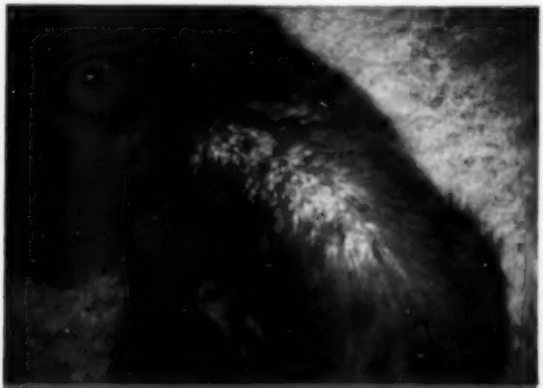

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gives hair a healthier, glossier appearance.

Often effective where other treatment fails, SELEEN is easy, safe to use. Like a shampoo, it lathers fast . . . rinses easily . . . takes only 10-15 minutes per treatment. Non-toxic SELEEN has a pleasant odor, causes no carpet or furniture stains.

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(COMING MEETINGS—*continued from p. 30*)

East Bay (Calif.) Veterinary Medical Association, bimonthly, the fourth Wednesday. John T. Turver, 1201 E. 12th St., Oakland 6, Calif., secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. R. P. Link, College of Veterinary Medicine, University of Illinois, Urbana, Ill., secretary.

Eastern North Carolina Veterinary Medical Association, the first Friday of each month. John D. Baker, Goldsboro, N. Car., secretary.

Fayette County Veterinary Association, Iowa, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Greater St. Louis (Mo.) Veterinary Medical Association, the first Friday of the month (except July and August) at the Sheraton Hotel, Spring Ave. and Lindell Blvd. Allen B. Shopmaker, 136 N. Meramec, Clayton 5, Mo., secretary.

Jacksonville (Fla.) Veterinary Medical Association, the second Thursday of each month, time and place specified monthly. L. D. Barrett, Rt. 8, Box 572, Jacksonville, Fla., secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month, in Louisville or within a radius of 50 miles. Dr. W. E. Bewley, P. O. Box "H", Crestwood, Ky., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at alternating hospitals. W. F. Noland, 7504 Metcalf, Overland Park, Kan., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month at Exchange Hall, ninth floor, Livestock Exchange Bldg., 1600 Genessee St., Kansas City, Mo. Busch Meredith, 800 Woodswether Rd., Kansas City 5, Mo., secretary.

Kern County (Calif.) Veterinary Medical Association, the first Thursday evening of each month. B. C. Watson, 825 14th St., Bakersfield, Calif., secretary.

Keystone (Pa.) Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania School of Veterinary Medicine, 39th and Woodland Ave., Philadelphia 4, Pa. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

Kyowva (Ky., Ohio, W. Va.) Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Harry J. Fallon, 200 5th St. W., Huntington, W. Va.

(*Continued on p. 33*)

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for the effective treatment of skin conditions

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MAJOR ADVANTAGES: High protective titers developed within 7 days. Protection lasts at least 6 months.[1] Stable, potent.

Annual losses from bovine leptospirosis are estimated at over 112 million dollars — 25 million dollars greater than losses from bovine brucellosis.[2] With *new* 'ANTILEPTO', semi-annual vaccination of beef and dairy cattle will control the spread of the disease—check losses in animals and milk.

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References: 1. Brown, A. L., et al.: To be published. 2. Agricultural Research Service, Losses in Agriculture, June 1954, Table 20, p. 129.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April at the Academy of Medicine, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Milburn Ave., Maplewood, N. J., secretary.

Michiana Veterinary Medical Association, the second Thursday of each month, at the Hotel LaSalle, South Bend, Ind. L. D. Ramsay, 719 E. Jefferson Ave., La Porte, Ind., secretary.

Michigan, Southeastern Veterinary Medical Association, the second Thursday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Road, Detroit 5, Mich., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. George McCollister, 2146 Broad St., San Luis Obispo, Calif., secretary.

Mid-State (Mich.) Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert E. Kader, 5034 Armstrong Rd., Lansing 17, Mich., secretary.

Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. George F. Lynch, 201 West Devon St., Milwaukee 17, Wis., secretary.

Monterey Bay Area (Calif.) Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 90, Corral de Tierra, Salinas, Calif., secretary.

New Castle County (Del.) Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. Arthur P. Coogan, 2102 New Road, Wilmington 5, Del., secretary.

New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Wisneslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northern Colorado Veterinary Medical Society, the second Monday of each month. William H. Beckenhauer, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Casa Mana in Teaneck, N. J. Edward Baker, 568 Grand Ave., Englewood, N. J., secretary.

(*Continued on p. 34*)

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you are buying SERVICE!

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(COMING MEETINGS—*continued from p. 33*)

Northern San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. Ernest Makino, Patterson, Calif., secretary.

Oklahoma County Veterinary Medical Association, the second Wednesday of every month except July and August. Carl L. Clark, 127 N. W. 23rd St., Oklahoma City, Okla., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month at 8:00 p.m. in Antlers Hotel, San Bernardino, Calif. Jay C. Wallis, 112 N. Girard St., Hemet, Calif., secretary.

Orange County (Calif.) Veterinary Medical Association, the third Thursday of each month. Donald E. Lind, 2643 N. Main St., Santa Ana, Calif., secretary.

Peninsula (Calif.) Veterinary Medical Association, the third Monday of each month. T. D. Harris, San Mateo, Calif., secretary.

Piedmont (N. Car.) Veterinary Medical Association, the last Friday of each month at 7:00 p.m. in Mull's Motel in Hickory, N. Car. W. W. Dickson, Box 1071, Gastonia, N. Car., secretary.

Piedmont (S. Car.) Veterinary Medical Association, the third Wednesday of each month at the Fairforest Hotel, Union, S. Car. Worth Lanier, York, S. Car., secretary.

Pima County (Ariz.) Veterinary Medical Association, the third Wednesday of each month in Tucson. E. T. Anderson, 8420 Tanque Verde Rd., Tucson, Ariz., secretary.

Redwood Empire (Calif.) Veterinary Medical Association, the third Thursday of each month. Robert E. Clark, Napa, Calif., secretary.

Sacramento Valley (Calif.) Veterinary Medical Association, the second Wednesday of each month. W. E. Steinmetz, 4227 Freeport Blvd., Sacramento, Calif., secretary.

Saginaw Valley (Mich.) Veterinary Medical Association, the last Wednesday of each month. S. Correll, Rt. 1, Midland, Mich., secretary.

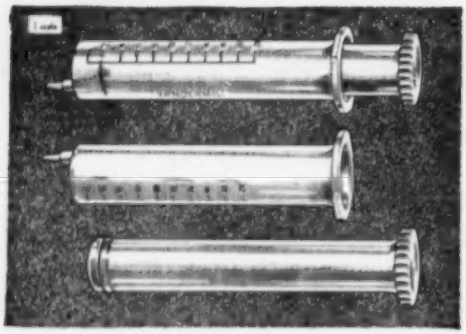
San Diego County (Calif.) Veterinary Medical Association, the fourth Tuesday of each month. H. R. Rossoll, 1795 Moore St., San Diego, Calif., secretary.

San Fernando Valley (Calif.) Veterinary Medical Association, the second Friday of each month at Eaton's Restaurant in Studio City, Calif. R. A. Button, 5954 Van Nuys Blvd., Van Nuys, Calif., secretary.

Seattle Veterinary Medical Association, the third Tuesday of each month in the Trinity Episcopal Church, 8th and James St., Seattle, Wash. P. R., Des Rosiers, 5508 2nd Ave. N. W., Seattle 7, Wash., secretary.

Southeastern (Mich.) Veterinary Medical Asso-

(*Continued on p. 36*)



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A syringe that is unbreakable, with 200 boiling hours. A needle that gives up to 400 insertions with a point that is completely revolutionary in design.

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DESTRUCTOR

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The compact **DESTRUCTOR** is easy-to-use, attractively designed and completely weatherproofed for installation in outdoor locations and environments.

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"33 YEARS OF COMBUSTION EXPERIENCE"

For further details mail this advertisement with your letterhead.

NEW 'Antilepto'
LEPTOSPIRA BACTERIN

New, improved immunizing agent against bovine leptospirosis

MAJOR ADVANTAGES: High protective titers developed within 7 days. Protection lasts at least 6 months.[1] Stable, potent.

Annual losses from bovine leptospirosis are estimated at over 112 million dollars — 25 million dollars greater than losses from bovine brucellosis.[2] With *new* 'ANTILEPTO', semi-annual vaccination of beef and dairy cattle will control the spread of the disease—check losses in animals and milk.

Available exclusively to licensed veterinarians.

Supplied: 25-cc. (5-dose) and 100-cc. (20-dose) vials.

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References: 1. Brown, A. L., et al.: To be published. 2. Agricultural Research Service, Losses in Agriculture, June 1954, Table 20, p. 129.

(COMING MEETINGS—*continued from p. 34*)

ciation, the fourth Wednesday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Rd., Detroit 5, Mich., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. E. T. Anderson, Rt. 2, Box 697, Tucson, Ariz., secretary.

Southern California Veterinary Medical Association, the third Wednesday of each month. Howard C. Taylor, 2811 West Olive St., Burbank, Calif., secretary.

South Florida Veterinary Society, the third Tuesday of each month, at the Seven Seas Restaurant, Miami, Fla. E. D. Stoddard, 6432 S. W. 8th St., Miami, Fla., secretary.

South Puget Sound (Wash.) Veterinary Medical Association, the second Thursday of each month except July and August. Jo Walker, Agriculture Experiment Station, Puyallup, Wash., secretary.

Tenth District (Ind.) Veterinary Medical Association the third Thursday of each month. W. E. Sharp, Union City, Ind., secretary.

Tulare County (Calif.) Veterinarians, the second Thursday of each month. R. B. Barsaleau, 2333 E. Mineral King, Visalia, Calif., secretary.

Tulsa (Okla.) Veterinary Medical Association, the third Thursday of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Merle S. Watts, 5302 E. 11th St., Tulsa, Okla., secretary.

SELF FILLING SYRINGE

The multi-injector's third hand

Another accurate smooth working ground glass barrel — leak proof metal plunger instrument with many possibilities. Adjustable for any capacity. By attaching one end of a rubber tube to the self-filling syringe and the other to a bottle of serum or vaccine any number of quick 1/4cc to 5cc accurate dose injections can be made. The instrument is operated with one hand. Anyone who injects a large number of animals will find the Self-Filling Syringe will pay for itself both in labor and serum saved after the first day's use.

Sizes 2cc and 5cc

Literature upon request

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ANOREXIA, INABILITY TO RISE, AND DECREASED MILK PRODUCTION CHARACTERIZE KETOSIS

For ketosis unresponsive to glucose

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Clinical studies have shown that CORTONE is particularly effective in treating both pre- and post-partum ketosis in dairy cattle. A single injection frequently produces remission —with milk production returning to normal in as little as three days even in cases which have proved refractory to parenteral glucose.

OTHER INDICATIONS: Inflammatory eye diseases, extensive burns, allergic dermatoses, and rheumatoid arthritis in dogs, cats, cattle and horses.

SUPPLIED: Saline Suspension of CORTONE Acetate Veterinary: 50 mg./cc., vials of 10 cc.

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New, improved immunizing agent against bovine leptospirosis

MAJOR ADVANTAGES: High protective titers developed within 7 days. Protection lasts at least 6 months.[1] Stable, potent.

Annual losses from bovine leptospirosis are estimated at over 112 million dollars — 25 million dollars greater than losses from bovine brucellosis.[2] With *new* 'ANTILEPTO', semi-annual vaccination of beef and dairy cattle will control the spread of the disease — check losses in animals and milk.

Available exclusively to licensed veterinarians.

Supplied: 25-cc. (5-dose) and 100-cc. (20-dose) vials.

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References: 1. Brown, A. L., et al.: To be published. 2. Agricultural Research Service, Losses in Agriculture, June 1954, Table 20, p. 129.

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Personal Want Ads—$4.00 for the first 25 words and 10 cents for each additional word; 35 cents for use of box number.

Commercial Want Ads—$5.00 for the first 25 words, 25 cents for each additional word.

Remittance must accompany ad.

Deadline for want ads 8th of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

Wanted—Veterinarians

Veterinarian wanted for Livestock Disease Control State Laboratory in Boise, Idaho. Address Room 206, Statehouse, Boise, Idaho.

Veterinary director wanted for large animal diagnostic laboratory in Florida. Veterinary pathologist, parasitologist, toxicologist, and poultry pathologists also needed. Liberal vacation and sick leave, good retirement program. Address Dr. C. L. Campbell, State Veterinarian, P. O. Box 389, Tallahassee, Fla.

(Continued on p. 42)

KEEP TEAT OPEN — KEEP IT MILKING

To maintain unrestricted milk flow and provide antiseptic protection is of first importance in the care of Injured teats, Scab teats, Stenosis, and in post operative therapy. Dr. Naylor Medicated Teat Dilators are SULFA-impregnated surgical dressings for the teat canal.

They act both medically and mechanically to provide prolonged broad spectrum germicidal activity and gentle non-irritating support to traumatized sphincter and teat mucosa. They promote normal tissue repair with a minimum of altered milking function of the streak canal. Positive retention — fit large or small teats.

WITH ANTIBIOTICS

The soft, highly absorbent properties of Dr. Naylor Dilators make them an ideal vehicle for additional local medication of your choice. To obtain the synergistic bactericidal action of Antibiotics and Sulfathiazole following teat surgery, saturate with your favorite udder infusion antibiotic.

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DISPENSING PACKAGE (Contains 12 Dilators) ... $2.00 per doz. →

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REPORT ON
RECENT RESEARCH

Light worm loads are putting a serious drag on most "healthy" cattle

**Two-year tests were conducted on 600 lightly parasitized calves. Those treated with phenothiazine under the two-way program produced better gain than the untreated group.*

Tests show that stomach worms are robbing cattle of growth and vigor, stealing profits from practically every herd in the country . . . even in the colder northern states. While most of the infections are light, and few animals show clinical symptoms, the conditions represent a substantial part of the ½ billion dollars lost annually to internal parasites.

Now, field studies* prove that much of this loss can be prevented. A two-way program of control with the anthelminthic phenothiazine is recommended. First, use therapeutic doses of the drug to eliminate adult worms; then keep down reinfection and suppress the production of viable parasite eggs with low-level feeding of phenothiazine in supplement, mineral mix, or salt.

NEW INFORMATION ABOUT INTERNAL PARASITES, a review of developments in livestock parasitology is compiled periodically by the Du Pont Company for veterinarians and animal health specialists. To receive it regularly—or for specific information on the control of internal parasites with phenothiazine, simply write to E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Animal Industry and Nutrition Section, Wilmington 98, Delaware. Phenothiazine products are available through suppliers of veterinary products.

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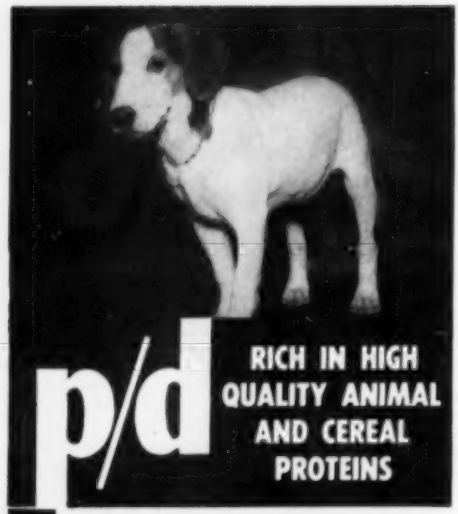
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

Phenothiazine



DIAGNOSIS

A three months old pup for distemper vaccination. Fecal examination—hookworm (3 plus), red blood cell count 3,000,000. Dog is underweight and growth is retarded.

TREATMENT

Administer serum, prescribe p/d 50 calories per body pound daily, treat for intestinal parasites one week later and proceed with immunization when patient is in satisfactory condition.

SCIENTIFIC BASIS FOR PROCEDURE

Antibodies are developed from amino acids made available from high quality dietary protein.

(Inquiry form for graduate veterinarians only)
HILL PACKING COMPANY, Box 148, Topeka, Kan.
Send information on therapeutic feeding ☐
Send information on other Hill products ☐

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ADDRESS.....

CITY AND STATE.....

HILL PACKING COMPANY
P.O. Box 148 Topeka, Kan.

Correspondence

August 24, 1955

Editor:

We received a letter today from a Middlewest state which opens as follows:

Dear Sir:
The local veterinarian seems to be very good at doctoring cows, but he doesn't seem to care for cats, so I'm asking you for help.
I asked him if my 3-year-old tom cat could be castrated. I quote his answer: 'Just put him into a boot, head down, and trim him.' Not for me, thanks! I think a good vet would put a cat to sleep, and shouldn't any operation be performed before a cat had his breakfast, unless in case of emergency?

Veterinarians talk a great deal about public relations. The implication is that the local, state, or national organization should hire someone who, through feats of eloquence, will build good relations for the profession. This letter illustrates very significantly that good public relations are either built or destroyed by each of us every day.

Gerry B. Schnelle, V.M.D., Chief of Staff,
Angell Memorial Animal Hospital,
Boston, Mass.

• • •

Aug. 15, 1955

Dear Editor:

With regard to the letter from Dr. K. F. Meyer published in the JOURNAL, August, 1955 (page 136), in my opinion no one man may change general terminology unless there is agreement. It is my feeling that the word "psittacosis" is no more horrendous than the word "ornithosis." It might be more misleading and less informative if we were to change the name of this entire group of diseases to that of "miyagawanellosis," which it etiologically should be.

Dr. Meyer's letter is dated the 17th of January, 1955; however, an official report of the American Public Health Association, "Control of Communicable Diseases in Man", published in February, 1955 (page 137), uses the term "psittacosis" to cover infection from a number of reservoirs. Although the strains of organism may vary antigenically, depending upon the normal species in which the strain is located, no one without actual typing of same can determine whether a given human disease is caused by the psittacine type or turkey type, and, if either one is suspected, whether the turkeys or psittacines involved are in fact carriers of the similar type. It would be difficult to determine whether a parakeet that had possibly brought infection to a turkey farm had given the turkeys psittacosis virus or turkey ornithosis virus.

The workers in the turkey industry must still be prepared for the new disease, namely, ornithosis. Psittacosis and ornithosis are reasonably synony-

mous and, if it will make anyone happier, one or the other can be placed in quotes.

On page 296 of "The dynamics of Virus and Rickettsial Infections," Dr. Meyer refers to "viruses of the psittacosis group," indicating to me that this group of viruses—even those coming from turkeys—was in the *psittacosis* group. The term "ornithosis," to me, is quite ambiguous inasmuch as it refers to ornithos, from the Greek meaning "bird," and therefore could very readily be interpreted to mean "disease of birds." Since birds are afflicted with a number of viruses, I wonder on what basis we can logically assume that the correct term to apply is "ornithosis"? It would be the same as saying, "All virus diseases of mammals should be classified as mammalosis." If psittacosis is to be restricted to the psittaciformes, then perhaps when the disease occurs in chickens we should call it "galliformosis." In ruminating further, perhaps a virus disease of ruminants could be called "ruminosis."

We must agree that there is a disease in turkeys that human beings do get, particularly workers in the field and industrial workers in slaughterhouses, and that the human manifestations of this disease are quite similar to the disease we had known as psittacosis. But regardless of the name, there is a disease which we all agree must be brought under control. I shall not quibble as to the terminology if we work together to get rid of the disease.

Cordially yours,
Oscar Sussman,
Princeton, N. J.

Dr. Bramel Joins Staff of Sharp & Dohme

Dr. Robert G. Bramel (ILL '52) has been appointed to the veterinary staff of Sharp & Dohme, Division of Merck & Co., Inc., according to Dr. William P. Boger, director of the Sharp & Dohme medical division.

Dr. Bramel joined the pharmaceutical firm following three years of private veterinary practice in Springfield, Ill. He is a graduate of the University of Illinois where he received his B.S. in bacteriology in 1948 and his D.V.M. in 1952.

Prior to his university work, Dr. Bramel had served for three years with the U. S. Navy.

HP Helps Protect the men who protect the herds of America

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Quick relief for Bone, Bursal or Tendon Lameness
Single Bottle.....$2.00
3 and 1 free.....5.00
6 and 2 free.....9.00
12 and 4 free.....17.00
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Hudson, N. Y.

BUY THE BEST

KASCO DOG FOOD
Manufactured by KASCO MILLS
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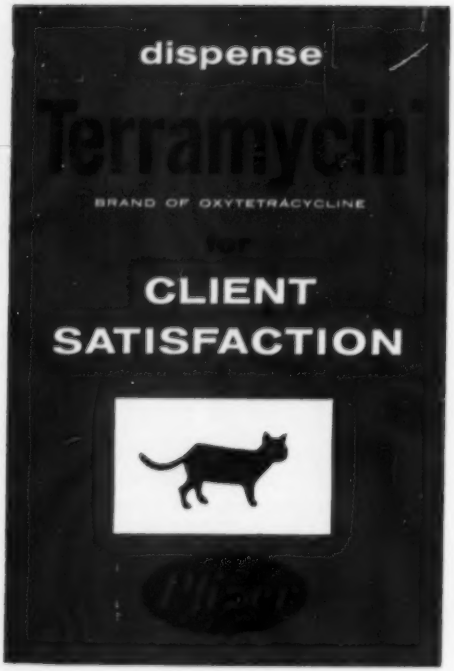


(CLASSIFIED ADS—*continued from p. 38*)

Veterinarian wanted for laboratory diagnostic work and some research at state veterinary laboratory. Address Wyoming State Veterinary Laboratory, P.O. Box 960, Laramie, Wyo.

Veterinarian wanted to assist in large animal practice in eastern Iowa. Good future possibility. Send complete personal data and background, and give starting salary desired. Address "Box X 1," c/o JOURNAL of the AVMA.

Veterinarian wanted to take charge of small animal hospital; position leading to partnership. New Jersey license required. Address "Box X 3," c/o JOURNAL of the AVMA.

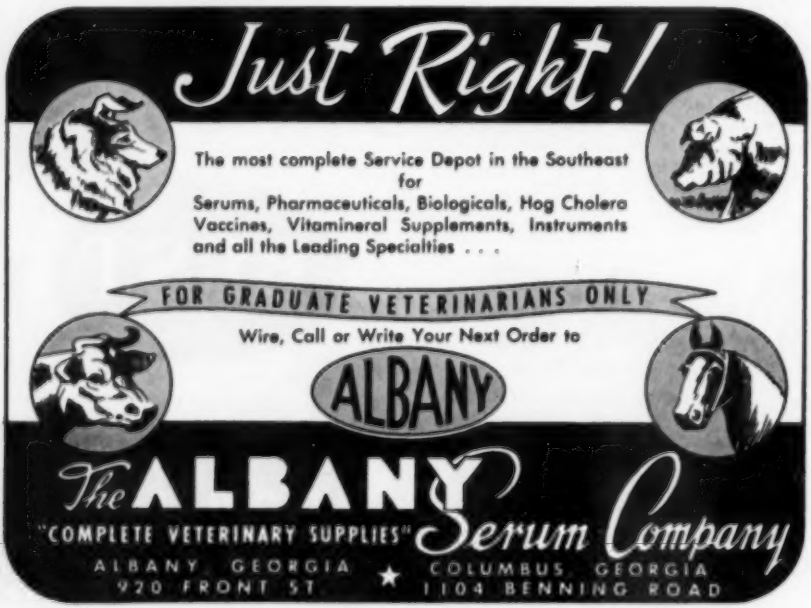
Remittance must accompany advertisement

Veterinarians needed for staff of metropolitan small animal hospital; must have New York license. Address "Box X 8," c/o JOURNAL of the AVMA.

Veterinarian wanted to associate with general practitioner in northern Indiana. Salary, first year, followed by percentage, leading to ownership. Clinic has comfortable living quarters. Address "Box X 11," c/o JOURNAL of the AVMA.

Veterinarian wanted as assistant in small animal practice on Long Island; must have New York State license. State qualifications and salary expected. Address "Box X 12," c/o JOURNAL of the AVMA.

(*Continued on p. 46*)



NOW! Fast . . . Safe . . . SURE Way To Dehorn Calves

Sunbeam STEWART

AUTOMATIC HEAT CONTROL CALF DEHORNER

Electric dehorning with the new Sunbeam Stewart Calf Dehorner is *fast, safe* and *certain.* Dehorning can be done any time of year. Only a few minutes are required for the entire job. No loss of blood—no open flesh wound—no bad after effects. Dehorner has automatic control for steady high heat for dehorning or soldering. $14.95, complete. (Without soldering tip, $13.50.)

- Automatic Control for Steady Heat
- Fast—Easy to Use
- No Loss of Blood—No Open Flesh Wound

Becomes heavy-duty soldering iron when soldering tip is attached.

Write for information about Sunbeam Stewart Dehorner and animal clipping equipment

Sunbeam CORPORATION *(formerly Chicago Flexible Shaft Company)*

5600 W. Roosevelt Rd., Dept. 47, Chicago 50, Illinois

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iodine and methyl salicylate ingredients long tried—proved clinically, are the heart of

IODEX

cum Methyl Salicylate

Combining the therapeutic efficacy of iodine and the analgesia of methyl salicylate . . . Excellent performance in relieving lameness, strains and sprains . . . muscle, joint and nerve inflammations . . . fungus infections . . . irritations and eruptions of the skin.

Softening, soothing, relaxing to the skin, characteristic of a true emollient.

Samples and literature on request.

MENLEY & JAMES, LTD.
91-27—138th Place, Jamaica 35, N. Y.

NEW 'Antilepto'

LEPTOSPIRA BACTERIN

New, improved immunizing agent against bovine leptospirosis

MAJOR ADVANTAGES: High protective titers developed within 7 days. Protection lasts at least 6 months.[1] Stable, potent.

Annual losses from bovine leptospirosis are estimated at over 112 million dollars—25 million dollars greater than losses from bovine brucellosis.[2] With *new* 'ANTILEPTO', semi-annual vaccination of beef and dairy cattle will control the spread of the disease—check losses in animals and milk.

Available exclusively to licensed veterinarians.

Supplied: 25-cc. (5-dose) and 100-cc. (20-dose) vials.

SHARP & DOHME

Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.

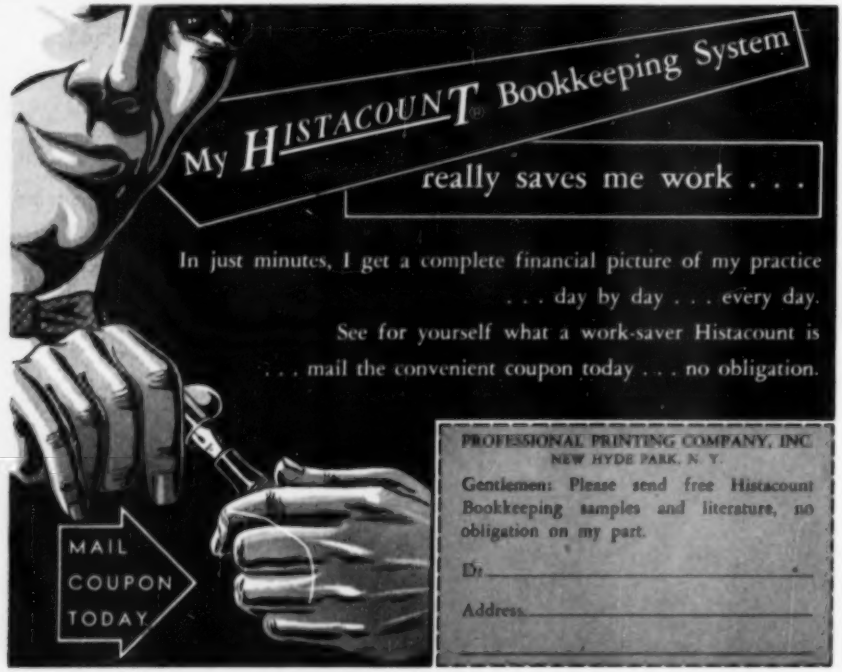
References: 1. Brown, A. L., et al.: To be published. 2. Agricultural Research Service, Losses in Agriculture, June 1954, Table 20, p. 129.

Dr. Quin Made Senior Vice-President and Director of Jen-Sal

Dr. A. H. Quin, for several years a vice-president and director of professional services of Jensen-Salsbery Laboratories, Inc., Kansas City, was

Dr. A. H. Quin

recently made senior vice-president and a director of the company. He will continue to carry on professional services work in addition to his other assignments.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In just minutes, I get a complete financial picture of my practice
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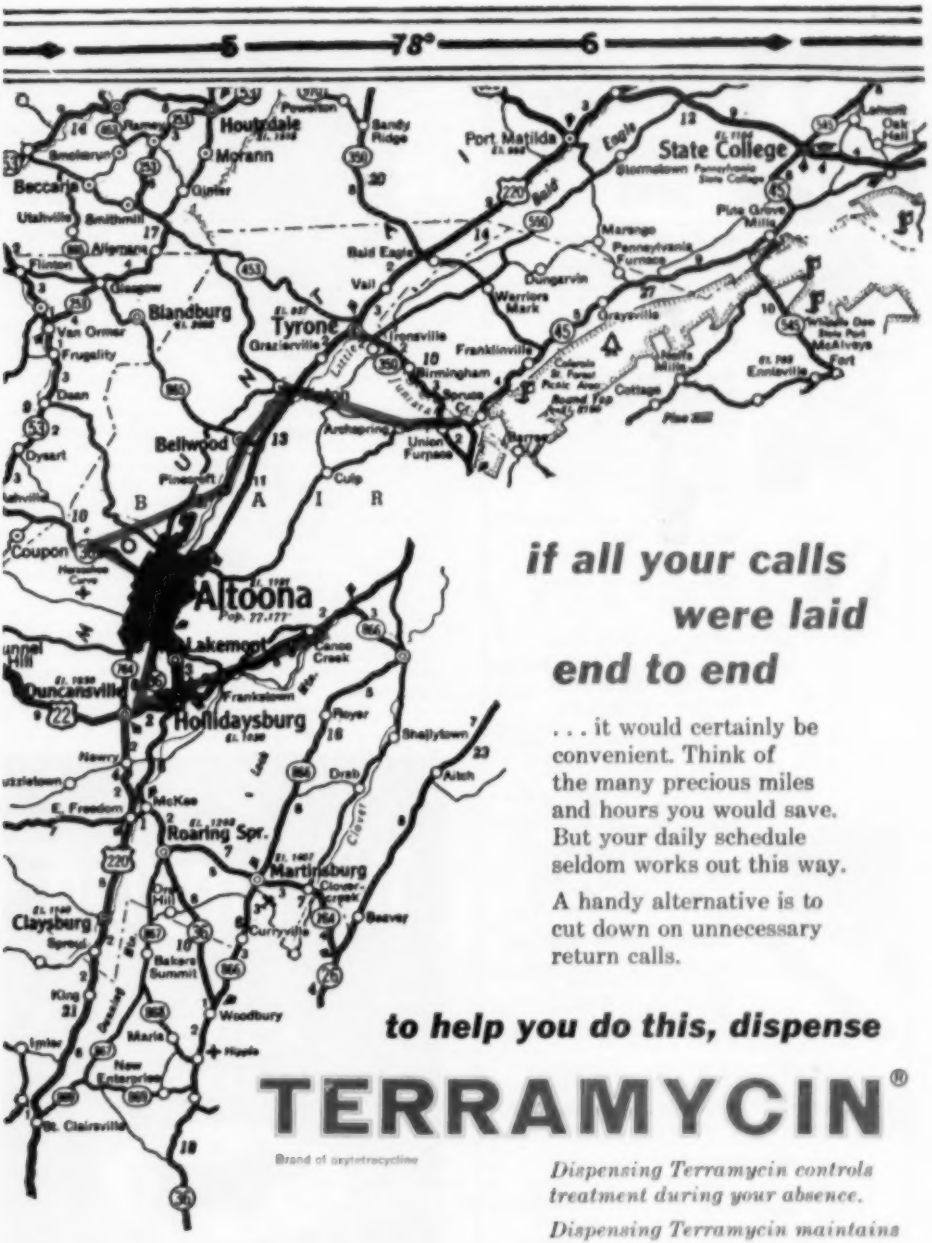


if all your calls were laid end to end

. . . it would certainly be convenient. Think of the many precious miles and hours you would save. But your daily schedule seldom works out this way.

A handy alternative is to cut down on unnecessary return calls.

to help you do this, dispense

TERRAMYCIN®

Brand of oxytetracycline

Dispensing Terramycin controls treatment during your absence.

Dispensing Terramycin maintains effective follow-up therapy.

Dispensing Terramycin provides a reliable service to your client and a handy profit to yourself.

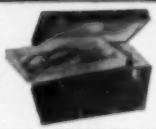
Department of Veterinary Medicine

Pfizer

PFIZER LABORATORIES, Brooklyn 6, N.Y.
Division, Chas. Pfizer & Co., Inc.

NICHOLSON

veterinary equipment news



durable, metal sheathed instrument/serum cases

Baked black enamel over steel with brass trim. 5 standard models; light weight, yet built to take knocks! See folder N-1 for sizes, prices.

new do-it-yourself Plasti-Plated cages

Before you buy cages, write for folder N-2 on our amazing new Plasti-Plated kennels. Rock-hard, glass-smooth, seamless surfaces. Inexpensive, easy to do-it-yourself!

electric "B" dairy cow branding iron

Heats in 90 seconds, makes a clean brand, weighs only 11 ounces. T and V brands available too. Uses 110 v. current, won't smoke. Write for folder N-3.

new! clear plastic cases for your glass syringes

Keep syringes sterile, clean in these light, unbreakable plastic cases. Covers for 5, 10 and 20 cc. syringes, $5.75 set, folder N-4 gives details.

new! plastic sign letters for your hospital

Our new selection of beautiful weatherproof plastic signs will dress-up your office or clinic. All sizes, colors; easily installed. Write for folder N-5.

hi-current electric firing iron

Most modern, up-to-date way to fire horses, remove warty growths, ear polypi, tumors. Complete with 11 points/tips. Write for folder N-6.

☐ folder N-1 cases ☐ folder N-2 Plasti-Plate ☐ folder N-3 "B" irons

☐ folder N-4 syringe cases ☐ folder N-5 sign letters ☐ folder N-6 firing irons

Please send me the folders I've checked above.

DVM

street

city

Nicholson Manufacturing, Inc.
2440 East Third Avenue Denver 6

clip and mail today

(CLASSIFIED ADS—*continued from p. 42*)

Veterinarian wanted for small animal practice; suburb of New York City. Must be eligible for or have New York license. Address "Box X 15," c/o JOURNAL of the AVMA.

Would like veterinarian interested in small animals, as well as dairy practice, for mixed practice in Illinois. Permanent arrangement for right man. Address "Box X 19, c/o JOURNAL of the AVMA.

Wanted—Positions

Graduate of AVMA-approved school desires position with veterinary hospital; 5 years of experience in practice, including graduate work in surgery. Married; licensed in California, Illinois, and Michigan. Address "Box X 10," c/o JOURNAL of the AVMA.

Remittance must accompany advertisement

Recent graduate of AVMA-approved school desires association with small animal practitioner. Draft exempt. Available immediately. Address "Box X 14," c/o JOURNAL of the AVMA.

Future June graduate would like opportunity to work with practitioner in California or Oregon. References on request. Address "Box X 17," c/o JOURNAL of the AVMA.

Veterinarian with 4 years' experience in Iowa mixed practice wants position with future in commercial company. Address "X 22," c/o JOURNAL of the AVMA.

(*Continued on p. 48*)

Terramycin®

BRAND OF OXYTETRACYCLINE

for

ADDED INCOME

Pfizer

winner on points...

Bactine®

BRAND

germicide · fungicide · deodorizer

- superior efficacy... antibacterial action lasts for hours
  exceptional penetrating and cleansing action
  relieves pain and itching of skin irritations
  discourages scratching
- true deodorizer... eliminates, does not mask animal odors
  leaves a fresh, clean smell
- superior safety... well tolerated by large and small animals
  contains no iodine, mercury or phenol
  nondrying, nonirritating
- greater economy

CONCENTRATED *Bactine*—for professional use only. Eight times stronger than standard BACTINE. Available in 1-pint bottles. Must be diluted according to directions. A pint makes a gallon of standard BACTINE.

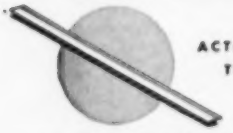
Standard BACTINE: Available in 1-gallon, 1-pint and 6-ounce bottles through your regular supplier, or we will assist you in ordering.

For further information and your free trial supply, write Dept. DK

MILES LABORATORIES, INC · ELKHART, INDIANA

Compare PRICE

Compare RESULTS and you will always Prescribe MASTICS®



ACTUAL SIZE
THE ORIGINAL
UDDER BOUGIE

MASTICS P&S

100,000 units penicillin
50,000 mcg. dihydrostreptomycin

MASTICS act fast because medication in high concentration is quickly dispersed throughout the quarter. Improvement often noted in 12 hours.

MASTICS contain no grease, no wax, no insoluble materials to remain in the udder retarding antibiotic action. MASTICS milk out completely—produce no residue on the strainer.

MASTICS are so effective, cows are returned to the herd more promptly with less loss of production.

LOW IN COST...HIGH IN POTENCY
MASTICS SAVE TIME, MONEY, MILK

WRITE FOR SAMPLES AND PRICES

The Martin Laboratories
West Chester, Penna.

(CLASSIFIED ADS—*continued from p. 46*)

Wanted—Practices

Desire to purchase or lease mixed or small animal practice in California or Arizona, preferably not in metropolitan Los Angeles. In answer, state cash required. Address "Box X 5," c/o JOURNAL of the AVMA.

Small animal practice wanted by veterinarian licensed in Florida. Will buy, lease, or work as assistant; must be a lucrative practice. South coastal Florida preferred. Address "Box X 7," c/o JOURNAL of the AVMA.

Remittance must accompany advertisement

Wanted in New York City, Westchester, or Long Island, an association, partnership, or purchase of active small animal hospital. Fully experienced with substantial down payment available. Address "Box X 9," c/o JOURNAL of the AVMA.

Experienced practitioner with finest references desires purchase good suburban practice in Bay Area or in southern California; substantial capital. Replies in strictest confidence. Address "Box X 13," c/o JOURNAL of the AVMA.

Veterinarian wants large animal practice or assistantship to general practitioner. Single, 25, draft exempt, experienced; California license. Prefer southern California or central coastal area. Address "Box X 18," c/o JOURNAL of the AVMA.

(*Continued on p. 50*)

Dr. Gray Elected President of Fort Dodge Laboratories

On September 14, Fort Dodge Laboratories, Inc., Fort Dodge, Iowa, announced the election of Dr. Burton J. Gray (ISC '43) as president and general manager. He succeeds Mr. Scott L. Barrett who has served the company in those capacities for many years and who now becomes chairman of the board.

Dr. Burton J. Gray

Dr. Gray is member-at-large of the AVMA Research Council, having been appointed to that position by the Executive Board in 1954 for a three-year term.

An important new idea in Distemper-Hepatitis Immunization

distemper hepatitis

sin-jex

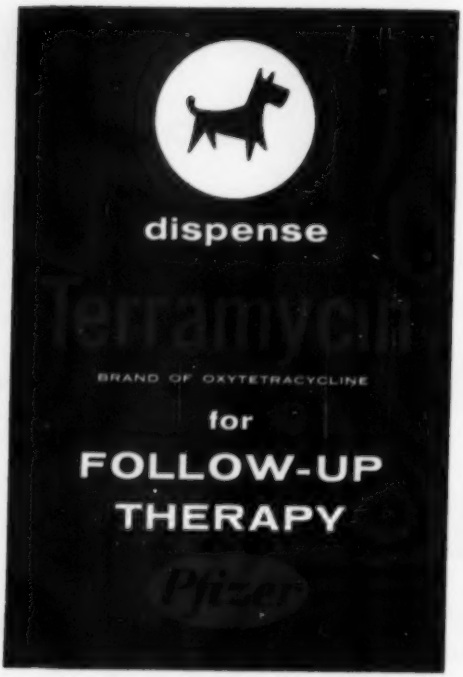
vaccine

Sin-jex **is the first Distemper-Hepatitis vaccine to utilize a vacuum dried *modified live virus* distemper fraction, with killed virus hepatitis fraction as diluent. *Sin-jex* gives more positive immunity against distemper: because the modified live virus distemper fraction elicits a more marked immunity response. *Sin-jex* is instantly reconstituted because of the R_L "reconsti-quick" feature. *Sin-jex* is a fine homogenous suspension which passes easily through a 22 guage needle. *Sin-jex* is easily administered with a single subcutaneous injection. *Sin-jex* may be given simultaneously with or without Anti-Canine Distemper-Infectious Hepatitis Anti-Serum. *Sin-jex* produces immunity in less than two weeks. *Sin-jex* may be used before or after weaning.**

Research Laboratories, Inc.
St. Joseph, Missouri

Available from

INDEPENDENT ETHICAL DISTRIBUTORS
selling to Licensed Veterinarians only
* TRADE MARK



(CLASSIFIED ADS—*continued from p. 48*)

Wanted, one-man hospital in Texas, predominantly small animal. Consider association with veterinarian planning to sell or retire. Address "Box X 21," c/o JOURNAL of the AVMA.

For Sale or Lease—Practices

Mixed practice for sale in Middlewest city of over 15,000. Grossing $18,000-$20,000 annually; 90% large animals; testing available. Includes modern downtown office, complete drugs, equipment, x-ray, etc. Address "Box V 14," c/o JOURNAL of the AVMA.

Small animal hospital for sale; 80% small animals, 20% large. Six-room modern home attached. Located in Iowa town of 30,000. Price, $16,000. Address "Box V 23," c/o JOURNAL of the AVMA.

Large, modern, small animal hospital for sale or lease in solid paycheck area of southern California. Established 8 years and going stronger every year; last 12 months, gross well over $100,000. Ideal for 2 or 3 man partnership. Require $30,000 to handle, with monthly terms arranged. Address "Box X 6," c/o JOURNAL of the AVMA.

Tucson, Arizona, bargain!! Mixed practice for sale; no competition, area of 20,000 population. Home, 2 acres, well, kennels; $6,000 handles. Write Strout Realty, 1317 S. 6th Ave., Tucson, Ariz.

(*Continued on p. 52*)

Jen-Sal

small animal therapy note

Anthol makes worming a simple task

When you worm dogs with Anthol, there's no guessing about tapeworms. Tapeworm masses are expelled intact. Ascarids, hookworms and whipworms are also dispatched efficiently by Anthol's unique Anthelin and Toluol combination. Fecal examinations are seldom necessary owing to Anthol's broad spectrum coverage of these 4 most common parasites. Five capsule sizes designed to cover the weight range of every canine patient from toys through St. Bernards.

packages of 25 capsules, sizes 0, 1, 2, 3, 4

Jensen-Salsbery Laboratories, Inc.
Kansas City, Missouri

Produced for exclusive use of the Graduate, Licensed Veterinarian

MEMBER: Associated Veterinary Laboratories, Inc.

IN THE GRAIN BELT CIRCLE OF QUALITY

The rigid standards embodied in Grain Belt products have been applied to a new line . . . Affiliated. These products, too, are of that high quality you have come to expect from Grain Belt. Our reputation, gained through 35 years of continuous service, is fully behind the entire Affiliated line. We invite you to use these products in full confidence. • The Grain Belt Supply Company, which has served you faithfully for many years, is proud to take part in bringing you the new Affiliated line.

GRAIN BELT SUPPLY COMPANY, 4902 South 33rd Street, OMAHA, NEBRASKA

FOR DERANGED LIPID METABOLISM...

LECIPET

The Complete Lipotropic Diet Supplement for Dogs

- Restores healthy hair and skin
- Improves breeding performance
- Rejuvenates older animals
- Safeguards health during lactation

In Ontario: F. T. Freeman
3 Newton St. Barrie

ASSOCIATED CONCENTRATES
57-01 32nd Avenue, Woodside 77, N.Y.

NEW 'Antilepto'
LEPTOSPIRA BACTERIN

New, improved immunizing agent against bovine leptospirosis

MAJOR ADVANTAGES: High protective titers developed within 7 days. Protection lasts at least 6 months.[1] Stable, potent.

Annual losses from bovine leptospirosis are estimated at over 112 million dollars — 25 million dollars greater than losses from bovine brucellosis.[2] With *new* 'ANTILEPTO', semi-annual vaccination of beef and dairy cattle will control the spread of the disease — check losses in animals and milk.

Available exclusively to licensed veterinarians.

Supplied: 25-cc. (5-dose) and 100-cc. (20-dose) vials.

SHARP & DOHME
Philadelphia 1, Pa.
DIVISION OF MERCK & CO., INC.

References: 1. Brown, A. L., et al.: To be published. 2. Agricultural Research Service, Losses in Agriculture, June 1954, Table 20, p. 129.

(CLASSIFIED ADS—*continued from p. 50*)

Excellent mixed practice for sale in northern New England; new animal hospital in process. Other interests force sale; available immediately. Valued at $15,000. Address "Box X 2," c/o JOURNAL of the AVMA.

Home and hospital for sale in Massachusetts; low overhead, high net; mainly small animals. Only veterinarian in city. Details on request. Address "Box X 4," c/o JOURNAL of the AVMA.

Newly established, growing mixed practice for sale or lease in New York. New, fully equipped 6-room small animal hospital; 9-room residence. Grossing, $15,000. Leaving for partnership. Address "Box X 16," c/o JOURNAL of the AVMA.

Small animal hospital and home for sale in Philadelphia area; excellent practice, high net income. Present owner accepting academic appointment. Address "Box X 20," c/o JOURNAL of the AVMA.

Miscellaneous

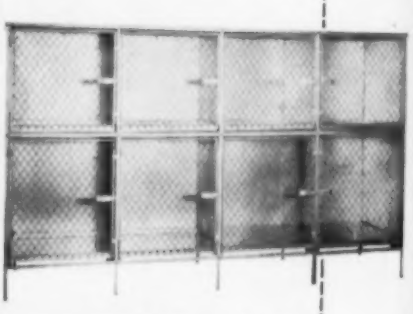
For sale—1954 Ranger chute; practically unused. Delivered free. Address E. L. Robinson, P.O. Box 5, Saratoga Springs, N. Y.

For sale—small animal mouth speculum. Used primarily to pass the stomach tube in dogs and cats; self-retaining, made of life-lasting plastic. Instructions included. Set of 2, $6.00. J. & G. Mfg. Co., 1585 Moore St., Akron 1, Ohio.

(*Continued on p. 54*)

Jen-Sal's all-metal 8 cage unit, $265

Whether you're dressing up an old cage ward or installing a new one, you should consider Jen-Sal's handsome aluminum-finished all-metal units. Prices as low as $33 each. The unit shown costs $265 for 8 cages. It's 9 feet 8 inches long; 6 feet 1 inch high; and 2 feet 5 inches deep. See our catalog page 262.



JSA-53K-81, metal cage, $265 f. o. b.

Jen-Sal
Jensen-Salsbery Laboratories, Inc.
Kansas City, Missouri
advanced instrument designs for advanced veterinary surgery

for dispensing and use by veterinarians only

for prevention and treatment of disease . . .

Terramix*-5

5 Gm. of oxytetracycline hydrochloride (Terramycin®) activity per lb.

Terramix*-10

10 Gm. of oxytetracycline hydrochloride (Terramycin®) activity per lb.

. . . the growth-promoting, nutrition-enhancing, disease-preventing and therapeutic activity of Terramycin® in a form easy to dispense and easy to administer . .

. . . these products blend readily into the livestock and poultry rations (grain, silage, or mash), and can conveniently be incorporated in premixes.

in the NEW 5-lb. re-usable dispensing canisters with removable labels

Pfizer

Department of Veterinary Medicine
PFIZER LABORATORIES, Brooklyn 6, N. Y.
Division, Chas. Pfizer & Co., Inc.

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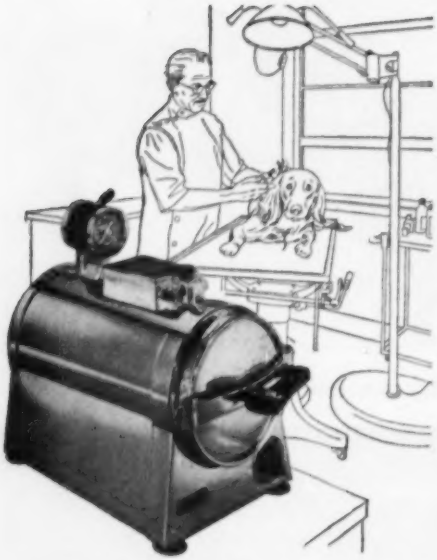

Better sterilization . . . to help you stop *Infectious Hepatitis*

No telling when one of your patients may be a carrier of a Hepatitis-causing virus. It is highly infectious.

Cases show this virus is not airborne. It is transmitted by contaminated instruments. Proper sterilization of needles and instruments is an important step in preventing its spread to other animals.

Autoclave sterilization—once expensive—is now available at a price you can afford. Castle's new "777" Speed-Clave, fully automatic and all stainless steel, costs just $224-$227.

Portable—it weighs 15 lbs. Saves time—gets to sterilizing temperatures in 4-8 minutes!

Get the full story. Mail coupon below.

to: Wilmot Castle Co.
1766 E. Henrietta Rd., Rochester, N. Y.

☐ Send folder on "777" Speed-Clave

Name_____

Street_____

City_____ State_____

My veterinary supply dealer is:_____

Castle LIGHTS AND STERILIZERS

(CLASSIFIED ADS—*continued from p. 52*)

Breeders' Sleeve—the disposable obstetrical sleeve. Package of 20 with detachable chest band, $5.00;, lower wholesale prices. Free sample upon request. Breeders Equipment Co., Flourtown, Pa.

Clipper Blade Sharpening—guaranteed to please you; factory trained. Our customers recommend us; 1,000 satisfied veterinarians. Avoid C.O.D., send money with blades, 75c per set; 24-hour service. Service Grinding Co., 903 Chicago St., Racine, Wis.

Pregnancy Diagnosis—in mare from 45th to 150th day. Write for vials and mailing tubes. Price: $7.00; 2 or more tests, $6.00 each. Pregnancy Diagnostic Laboratories, H. S. Lames, D.V.M., Dysart, Iowa.

U.S. Armed Forces Surplus

BLOOD BOTTLES

Baxter Transfuso Vac

50 cc. 4% Sodium Citrate w/v in Water Anticoagulant

$3.00 per doz. Minimum 6 doz.

F.O.B. Richmond, Va.

Hull St. Outlet
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P.O. Box 4101 Richmond, Va.

dispense

Terramycin

BRAND OF OXYTETRACYCLINE

for

GOOD RESULTS

Pfizer

It's actually easy to save money—when you buy United States Series E Savings Bonds through the automatic Payroll Savings Plan where you work! You just sign an application at your pay office; after that your saving is done for you. And the Bonds you receive will pay you interest at the rate of 3% per year, compounded semiannually, for as long as 19 years and 8 months, if you wish! Sign up today! Or, if you're self-employed, invest in Bonds regularly where you bank. For your own security, and your country's too, save with United States Savings Bonds!

Mrs. Brown refused to sink

"KEEP rowing or I'll toss you all overboard!"

The threat came from a red-headed woman dressed in corset and bloomers, with a Colt .45 lashed to her waist. And as the crowded lifeboat marked *S.S. Titanic* lurched into the waves, she rowed too, rowed until her hands bled.

Mrs. Margaret Tobin Brown had come a long way to take charge of that lifeboat. Once penniless, she now had millions, for her husband, "Leadville Johnny" Brown, had struck it rich. Once spurned by Denver society, she now hobnobbed with nobility.

But, as she said, "You can't wear the social register for water wings." Her $60,000 chinchilla cloak covered three frightened children; her other outer garments she had given to elderly women. She swore, threatened, sang grand opera, joked —and kept her boatload of wretched survivors going till rescue came.

When they asked her how she'd done it, she replied, "Typical Brown luck. I'm unsinkable." But it wasn't luck. It was pluck. And Americans have always had plenty of that smiling, hardy courage. When you come to think of it, that's one reason why our country's Savings Bonds rank among the world's finest investments.

For 160 million determined Americans back those Bonds.

The surest way to protect your security, and the nation's, is through United States Savings Bonds. Invest in them regularly—and hold on to them.

Safe as America—U.S. Savings Bonds

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100 mg.-500 mg.-1.0 Gm.-5.0 Gm.

POLYOTIC INTRAVENOUS:
100 mg.-2.5 Gm.

POLYOTIC OBLETS®: 4's-6 x 4's

POLYOTIC CAPSULES: 50 mg., 25's-100's;
100 mg., 100's; 250 mg., 16's-100's

POLYOTIC TABLETS: 50 mg., 25's-100's;
100 mg., 25's-100's; 250 mg., 16's-100's

POLYOTIC MASTITIS OINTMENT: ¼ oz.

POLYOTIC COMPOUND MASTITIS OINTMENT: ¼ oz.

POLYOTIC OPHTHALMIC OINTMENT 1%:
6 x ⅛ oz.

POLYOTIC TOPICAL OINTMENT 3%: 1 oz.

POLYOTIC SOLUBLE (Tinted) POWDER:
¼ lb.-½ lb.-1 lb.-5 lb.

AVIANIZED® RABIES VACCINE: (Canine):
1 dose-5 x 1 dose-10 doses

AVIANIZED RABIES VACCINE: (Cattle): 10 doses

AVIANIZED CANINE DISTEMPER VACCINE:
1 dose-10 x 1 dose

ANTI-CANINE DISTEMPER SERUM AND ANTI-INFECTIOUS CANINE HEPATITIS SERUM: 20 cc. 100 cc.

INFECTIOUS CANINE HEPATITIS VACCINE: 2 cc.-10 cc.

BRUCELLA ABORTUS VACCINE: 1 dose-5 x 1 dose-5 doses (25 cc.)

FELINE DISTEMPER VACCINE: 1 immunization (2 vials Vaccine, 2 vials Sterile Diluent, 2 cc.)

ANTI-FELINE DISTEMPER SERUM: 50 cc.

CARICIDE® Diethylcarbamazine TABLETS:
400 mg., 25's

DIETHYLSTILBESTROL SOLUTION: 10 cc.-50 cc.

LEPTOSPIRA CANICOLA-ICTEROHEMORRHAGIAE BACTERIN
Whole Culture Inactivated Vacuum-Dried.

Other products to be added.

*Trade-Mark

Lederle

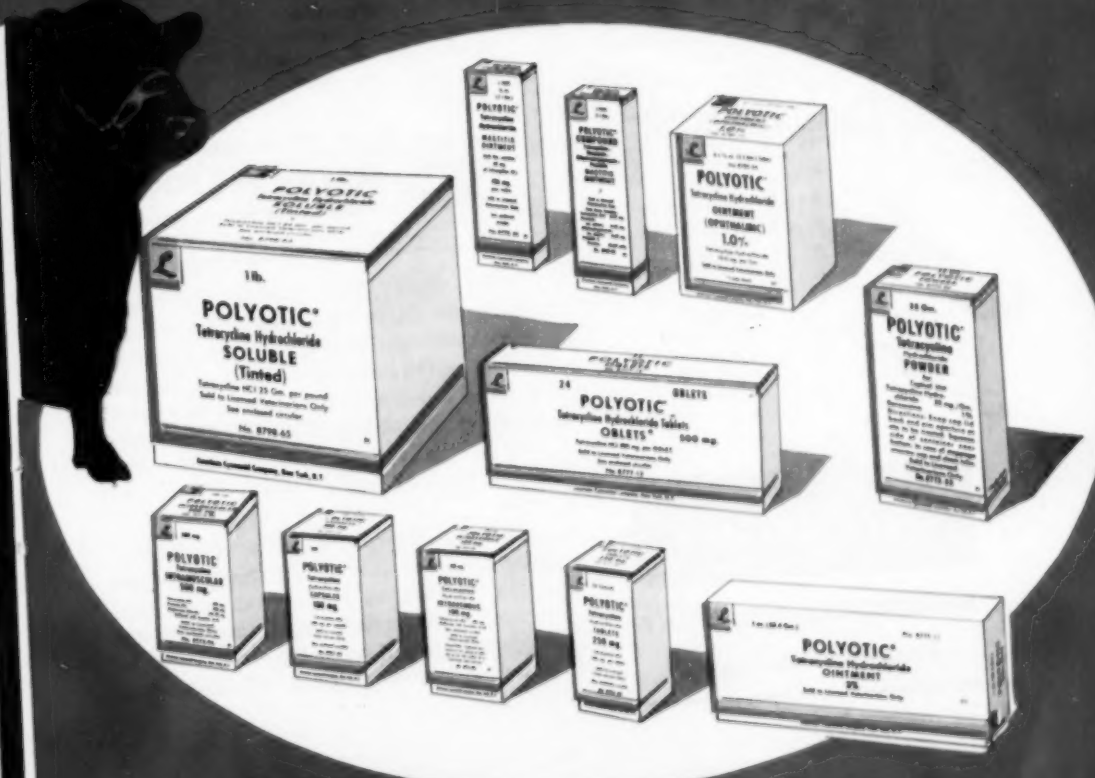
LEDERLE LABORATORIES DIVISION

Pearl River — AMERICAN Cyanamid COMPANY — New York

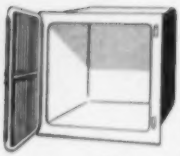
Tetracycline

Here is the newest of the broad-spectrum antibiotics, clinically proved and ready for intravenous, intramuscular, intrauterine, intravaginal, intramammary, conjunctival, aural and topical use.

No other antibiotic is available to the profession only in such a wide variety of dosage forms. No matter what route of administration, there is a POLYOTIC designed for proper professional application and for dispensing. Available to Licensed Veterinarians Only.



Value . . .



Yes, *true* value when you invest in **KIRSCHNER** products for your surgery or cage wards. . . After years of research, clinical tests and practical use, **KIRSCHNER** offers the finest equipment for the Veterinary Profession. . .

- Glass-Plastic Cages
- Life-time Cage Doors
- Gordon Extenders
- Thomas Splints
- Intramedullary Pins
- Mason Meta Splints
- External Pinning Equipment
- Fixation Pins
- Pin Cutters
- Pin Drills
- Knowles Toggle Pins
- Brown Femoral Head Prosthesis
- Oxygen Therapy Cage Doors
- M&M Rumenotomy Retractors

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Your new KIRSCHNER catalog is now ready. Write for your copy.

Kirschner

MANUFACTURING COMPANY

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For active immunization of dogs against canine distemper.

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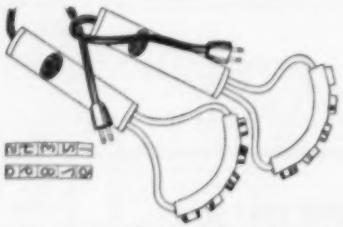
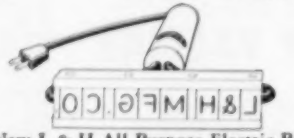


The letters are ⅞ inch, the most popular size. List Price of set, $69.50.



The New L & H All Purpose Electric Brander will brand any object that burns.
The price on Brander is $35.00. Letters or figures are $1.00 each, list.

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It's Safe . . . . No flame eliminates fire hazard—Completely insulated.
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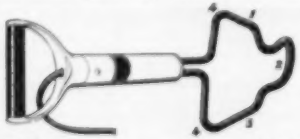

Universal Brander ..... List $42.50
1) 3 in. Bar; 2) 2 in. half circle; 3) 4 in. Bar; 4) corners may be used as running iron.

Deborner, without handle 29.50
Deborner, with handle ..... List 32.50

It's Simple . . .
Plugs into any 110 volt outlet or Standby generator. The tubular Rod type element is non-corrosive and self cleaning.

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But why MEN over 45?

Our doctors still don't know *why*, but if you are a man over 45 you are six times as likely to develop lung cancer as a man of your age twenty years ago. They *do* know, however, that their chances of saving your life could be about *ten times* greater if they could only detect cancer long before you yourself notice any symptom. (Only 1 in every 20 lung cancers is being cured today, largely because most cases progress too far before detected.)

That's why we urge that you make a habit of having your chest X-rayed every six months, no matter how well you may *feel*. The alarming increase of lung cancer in men over 45 more than justifies such precautions. Far too many men die *needlessly!*

Our new film "The Warning Shadow" will tell you what every man should know about lung cancer. To find where and when you can see this film, and to get life-saving facts about other forms of cancer, phone the American Cancer Society office nearest you or simply write to "Cancer"—in care of your local Post Office.

American Cancer Society

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for

AVMA Members

The policy, which was developed especially for Association members two decades ago, provides expert defense against claims and suits arising out of the care and treatment of animals, and will pay, to the extent of the policy limits, all expenses and damages resulting from unfavorable verdicts.

In this suit-conscious age, such protection is not only wise but, as shown by the claim files, a practical necessity.

The insurance is placed with one of the largest and most reliable underwriters in the country.

Write at once for an application and descriptive folder.

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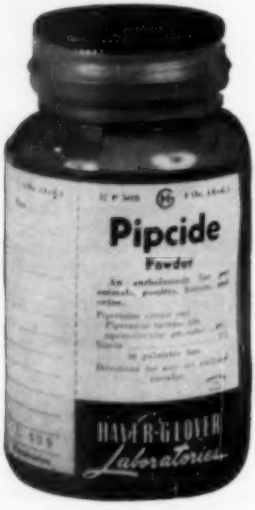
600 So. Michigan Ave., Chicago 5, Ill.

It's new and different!



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(PIPERAZINE CITRATE - TARTRATE WITH NIACIN)

an anthelmintic that can be given WET or DRY to pigs of any age

Also for Pets, Poultry and Horses

PIPCIDE POWDER is used for mass treatment of SWINE infested with **roundworms** or **nodular worms**; HORSES with **roundworms**, **pinworms**, and **small strongyles**; POULTRY with **roundworms**, and DOGS and CATS infested with **roundworms** and **hookworms**. Pipcide is water soluble and reinforced with niacin which is often lacking in the ration. Pregnant sows or pigs suffering from **gastritis** or **enteritis** are treated successfully without untoward results. Pipcide requires no **preliminary fasting** and the dose may be repeated as indicated.

Supplied in:
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Ctn. 12-4 oz. bottles
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FOR PREVENTION AND TREATMENT OF

Shipping Fever

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Anti-Hemorrhagic Septicemia Serum

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5 Gm. piperazine as
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